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Non-Traditional Commercial Defense Contractors

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The Center for Public Policy and Private Enterprise at the University of Maryland's School of Public Policy provides the strategic linkage between the public and private sector to develop and improve solutions to increasingly complex problems associated with the delivery of public services—a responsibility increasingly shared by both sectors. Operating at the nexus of public and private interests, the Center researches, develops, and promotes best practices; develops policy recommendations; and strives to influence senior decision-makers toward improved government and industry results.

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Executive Summary

The DoD's ability to exclusively rely on a defense-unique industrial base is rapidly coming to an end. While the potential ramifications of this unfolding reality have been debated since the 1986 Packard Commission, the business processes of the acquisition bureaucracy have not reflected nor adequately addressed this radical change in circumstances. The DoD has a choice. It can continue to use its declining budget to replicate advances already made in the commercial marketplace at a significant cost both from a budgetary and lost innovation perspective. Or it can embrace that market and implement policies and business practices that support the goal of achieving what then Under Secretary of Defense Kaminski described in 1995: "The military advantage goes to the nation who has the best cycle time to capture technologies that are commercially available; incorporate them in weapon systems; and get them fielded first."

At one time, the federal government and the DoD dominated research and development (R&D) spending. For example, in 1964, the federal government provided 67% of R&D funding and served as the driver of innovation in the economy. Today, the private sector provides over 60% of U.S. R&D funding and accounts for over 70% of its performance advances. As the trend toward private sector R&D intensified in the 1980s and 1990s, defense policy-makers began to focus on how to access this emerging commercial source of innovation, especially as commercial products began to prove cheaper and, often, more reliable. The result was a monumental acquisition reform effort in the early 1990s that paved the way for the incorporation of these commercial technologies and business practices into DoD systems. The introduction of commercial advances from the information technology industry enabled the 1990s net-centric revolution in military affairs and military advances to be on the cusp of an unmanned vehicle and robotics revolution that is based on many of these same commercial technologies.

Despite these efforts and the many other successful transitions of commercial technologies into DoD systems, many commercial, non-traditional contractors who are at the cutting edge of technological research and product creation still do not see the DoD as an attractive marketplace. Commercial item acquisition reforms of the 1990s never went as far as they should have to truly integrate the commercial marketplace into the DoD's acquisition planning and implementation,

and in the last five to seven years, the acquisition environment at the DoD for non-traditional commercial contractors has eroded significantly.

There is a widespread belief in industry that the entire paradigm for commercial contracting is under threat from within the Department of Defense. Until that is addressed, further commercial reforms will not be successful. While the auditing and contracting communities received most of the criticism for this change in environment, there were also concerns raised about the DoD's technical requirements and security communities. However, the biggest dissatisfactions were leveled against the senior leadership of the Office of the Secretary of Defense and the services, who some respondents believed didn't have a clear understanding of the relationship between the defense acquisition system and the global industrial base, and have not provided the support and backing for the acquisition of commercial items. In the absence of leadership advocacy and guidance, there is a belief that a whole-scale overturning of the acquisition reforms of the 1990s is being allowed to take place.

The openness of the defense market to commercial goods and services has declined significantly. In the last five years, the DoD has seen a return of a culture of risk aversion and adversarial business relations with industry. This culture has been allowed to re-assert itself due to leadership signals from both Congress and the executive branch. As a result, financial, intellectual property, and market risks have grown for commercial companies doing business with the DoD, while procurement, security, and oversight barriers have all risen.

Successful tools to access commercial contractors have been seriously undermined by statute, regulation, or practice. Several tools have been successful in encouraging non-traditional commercial contractors' participation in DoD acquisitions, and in return, allowing the DoD access to the contractors' technologies and expertise. These tools are market research, commercial item (Federal Acquisition Regulation [FAR] Part 12) contracting, Other Transactions Authority (OTA), rapid acquisition authorities, and the use of intermediaries—primes, large subsystems contractors, and resellers (although this last tool has its own costs). Regrettably, all of these methods are currently either under threat or underutilized in the current acquisition environment.

Still, a return to the acquisition policies that were tried in the 1990s will not be enough to halt the DoD's slide back to an increasingly unaffordable defense-unique industrial base that is challenged to incorporate new commercial technological developments. This is because commercial markets have not remained static in the last 20 years and the nature of these markets is changing. In the last 20 years, the relative significance of the U.S. global share of R&D has continued to decline. U.S. government R&D now equals about 11% of global R&D, and U.S. private sector R&D is about 17% of global R&D. Global commercial R&D is rising, and more commercial technologies are now being developed overseas and available to all countries, both friend and potential foe. While support for commercial item acquisition may have waned in the DoD during an era of expanding budgets, the rationale for taking advantage of an even larger share of commercial R&D is now greater than it was when acquisition reforms were first initiated in the 1990s, particularly as defense budgets decline. However, the issue is now more complicated than it was, given the global nature of commercial R&D, and security issues will become more prominent as barriers.

While a few commercial firms have left (or never entered) the defense market, many commercial firms are considering adjusting their structure in order to do business with the DoD and the U.S. government. A large segment of commercial firms are already organized to either sell only through government-unique intermediaries or have created government-unique subsidiaries that are more reflective of traditional defense contractors in cost structure and innovation. The DoD is currently obtaining adequate (although possibly not the best) commercial technology that it asks for primarily through intermediaries, but at a higher cost. The DoD risks falling behind technologically in the future, as commercial companies refuse to 1) modify their commercial off-the-shelf (COTS) products to avoid complying with government-unique oversight requirements; 2) share their intellectual property with the government for fear of having it released; or 3) invest in cutting edge R&D in the United States but rather move this investment overseas to avoid the reach of U.S. export controls and security requirements.

If the DoD is to continue to access the benefits of the commercial marketplace, the following recommendations should be considered. Senior leadership in the Department of Defense needs to aggressively advocate for the acquisition of commercial technology and the adoption and

integration of commercial business practices. This effort will require a long-term commitment, extending over several administrations. A successful advocacy plan would include the following actions:

1) Combat instances of requirements "gold-plating"—a process that continues to support the establishment and maintenance of military-unique requirements, standards, and practices.
2) Re-establish incentives to effectively and robustly use existing authorities to access commercial firms for more than just COTS solutions.
3) Ensure that DoD rapid acquisition organizations and capabilities are maintained and fully utilized, as a means to field solutions (especially commercial ones) faster.
4) Identify and implement best commercial acquisition practices (by commercial sector and DoD application) throughout the DoD enterprise. Focus audit agency oversight efforts on benchmarking these governmental and private sector "best commercial acquisition practices."
5) Encourage the establishment of non-traditional commercial entities in private sector firms that are exempt from unique government and DoD rules and oversight.
6) Expand the use of Other Transaction Authority (OTA) agreements within existing authority, and seek legislation, if necessary, to better use OTA authority for limited production, and to access non-traditional commercial subcontractors under a FAR Part 15 contract with a traditional defense prime contractor.
7) Improve market research in the Department and the services to better understand which commercial capabilities are available in the market.
8) Plan for a path to commerciality for non-traditional contractors when initially leveraging the commercial market for DoD requirements.
9) Establish a new "Section 800" panel to recommend specific legislative, regulatory, and policy changes that remove the inhibitions to the acquisition of commercial items. This new effort should especially review the implications of the globalization of R&D and the commercial supply chain to the DoD's ability to acquire this technology.
10) Periodically benchmark the costs of compliance with government and military-unique requirements, laws, regulations, practices, certifications, and standards.

I. Introduction and Methodology

There are many benefits to the federal government when commercial products can be used to meet requirements that include access to the latest technology, faster delivery, lower prices, integration of the defense and commercial industrial bases, access to commercial support services, and elimination of the need to fund the development and support of unique items. In recognition of these, Congress enacted the Federal Acquisition Streamlining Act (FASA) in 1994, establishing a preference for commercial-sector goods over specially produced ones, as long as the government's needs were not compromised. It was one of many initiatives enacted in the 1990s designed to entice new commercial entrants into the federal marketplace, especially at the Department of Defense (DoD), and was generally hailed by both industry and government leaders.

The use of commercial contracting practices allowed commercial companies to enter the government marketplace and provide products to both commercial and military customers, using common product lines and workforces. Internal investments to develop commercial products benefitted both commercial and military customers and created a larger production base with lower prices, due to economies of scale. The research and development for these products was paid for by these commercial companies, which freed up funding for the DoD to pursue other priorities.

In recent years, however, questions have been raised by industry and outside observers as to whether the process for the government's acquisition of goods and services from the commercial market has been destabilized and sub-optimized. Legislative and regulatory changes have potentially undermined FASA's reforms by imposing new government-unique acquisition oversight requirements that are inconsistent with commercial practices and threaten the commercial acquisition model. Additionally, there have been concerns raised by industry that DoD procurement officials have chosen to ignore the preference for the commercial contracting model by unilaterally resurrecting requirements that had been abandoned by, for example, requiring unneeded cost data for commercial items, or falling back to military-unique specifications. In addition, the globalization of the commercial supply chain has presented new

challenges to the incorporation of commercial items, a concept not fully appreciated two decades ago.

A steady erosion of the government's use of the streamlined approach to commercial acquisition is a cause for concern, incurring both monetary and innovation costs. "Regulatory creep," in the form of additional government-unique requirements, negatively impacts the government's ability to obtain the latest commercial technologies and services at the lowest possible prices. This regulatory creep, if left unchecked, could cause many current and potential suppliers of commercial items to withdraw from the government marketplace. Alternatively, excessive regulation could cause suppliers to re-establish separate government and commercial accounting, engineering, and production organizations at a substantial additional cost to the government.

If the DoD were to adopt additional policies that had the effect of limiting the ability of commercial companies to fulfill requirements with commercial technologies on major defense programs, the implications would be significant. The cost of these programs to the government would likely increase. Government and company independent research and development (IR&D) investments in technology improvements necessary for the DoD to maintain its technological dominance would be marginalized as more of this investment would be needed to be spent on duplicating what is already in the commercial marketplace, rather than investing in new technologies. This is a lose–lose situation for the DoD and the industrial base.

The focus of the current research was to explore these issues by assessing the status of past DoD acquisition reforms designed to access commercial technologies and services and determine current trends in commercial acquisitions with non-traditional, commercial contractors. The Center for Public Policy and Private Enterprise at the University of Maryland collected and analyzed reports, journals, articles, policies, and regulations, and other information sources from the DoD and the military services, as well as from commercial-sector associations and corporations. Additionally, the Center study team interviewed current and former DoD officials and representatives from the commercial sector and financial community. Lessons learned and persistent barriers to the participation of non-traditional commercial contractors were identified, and methods to overcome these barriers were defined.

The commercial firms selected for review and interview were identified from sectors that are important to the DoD. This was done by interviewing experts in the field; reviewing commercial R&D expenditures, technology leadership, and market share; and comparing this data with DoD spending requirements, current programs, and available information on the DoD's science and technology priorities. Both mature and emerging companies that may be leading candidates for developing future dual-use, defense-related technologies were identified. This is a subjective exercise and will continue to change, based on advances in the commercial sector and national security requirements. Company interviews were primarily limited by a firm's availability, time constraints, and willingness to participate in the study. In addition to interviewing a number of these firms, the study team attempted to maximize participation by working with some of the leading industry associations that collectively represented thousands of companies. Based on the interviews and data collected, various typologies and sectors of commercial firms were assessed to determine the degree that current policies, laws, practices, and regulations have encouraged or discouraged their participation in the defense market.

The key questions that the study tried to answer were the following:

- What commercial firms are (or could be) important in providing military solutions to the DoD?
- Do these firms choose to participate in the DoD marketplace? If so, in what manner?
- What level of technology is the DoD acquiring from leading commercial technology providers compared to other customers?
- Has the DoD acquisition environment improved in the last five years to attract commercial firms to participate in DoD contracting?
- Why do commercial firms choose not to participate in DoD contracting activities?
- What laws, rules, regulations, policies, and practices have successfully encouraged participation by commercial firms in the defense market?

One of the biggest challenges to this research was the individual firms' concerns about how their responses would be treated. Firms did not want to be identified by name and were very concerned about how the study team would use the information the firms provided. This concern extended even to the commercial contractors who did little business with the DoD. There appear

to be several major reasons for this concern. One was the hesitancy of firms to publically outline information and strategies that could potentially be used against them by their competitors. A second reason was just good business and public relations—there is no upside to publically criticizing a potential customer, no matter how remote the chances that you might actually sell to them. The third, more disconcerting and widespread reason, was the fear of retaliation by DoD acquisition and oversight officials. As one industry official stated, "Rarely has any good ever come to our firm by telling our customer he or she is wrong."[1]

As a result of the concerns by industry, this report does not identify the companies interviewed, and the study group allowed firms to provide information on a non-attribution basis. This allowed for a free discussion of specific issues within the DoD acquisition process. As a result, references to individual companies in this report are based on publically available data sources rather than interviews. We also relied on industry associations and outside experts to filter industry views. Many firms rely on associations to articulate common positions and provide some distance from the DoD customer, and therefore escape any negative reactions to their specific companies. However, in some associations, even this common position tends to be nuanced to avoid antagonizing the customer.

This study is a brief snapshot of the general environment that commercial companies encounter when participating in the DoD marketplace. While the study authors are satisfied that this paper identifies the most significant policy issues with commercial acquisition, we will continue to conduct industry interviews and surveys through the winter of 2014 to validate current conclusions and recommendations.

This report begins with a short history of the U.S. military's use of commercial contracting and outlines the case for, and the results of, the acquisition reforms of the 1990s. Section III discusses research and development trends and potential commercial technologies that may be important to the DoD in the future. Section IV explores the establishment of a typology of

[1] Interview with study authors.

traditional, non-traditional, commercial, and military-unique contractors. Section V discusses barriers to the use of non-traditional commercial contractors, and Section VI identifies tools that the DoD has found to be successful in accessing these companies. The final section lists conclusions and recommendations.

II. History of the U.S. Military's Use of Commercial Contracting

Since the Revolutionary War, the commercial industrial base and economic capacity in the United States has been important to, and relied upon by, the U.S. military. The U.S. Navy's first six frigates authorized in 1794 (the first large-scale weapons platform purchase by the U.S. government) were built in those shipbuilding communities that were producing commercial merchant ships. The Civil War necessitated the mobilization of industrial and commercial capacity on both sides of the conflict. An unfortunate upshot was the number of procurement scandals that ultimately led to the passage of the False Claims Act in 1863. Many of the same "waste, fraud and abuse" issues faced during the Civil War—related to product substitution, quality, and potential overcharging—were issues still plaguing acquisition officials during recent conflicts in Iraq and Afghanistan (Commission on Wartime Contracting, 2011).

Prior to World War I, responsibility for sustaining the defense industrial base fell for the most part to a few government-owned arsenals and facilities. During World War I, a private defense industry (including a nascent aircraft industry) began to develop, but did not ramp up production in time to make a major difference in the war. With the armistice, contracts were canceled and the industry evaporated. The fledgling airline and aircraft industry was kept alive due to U.S. government airmail contracts—not military contracts.

As World War II began, U.S. commercial industry converted to military applications and served as the "Arsenal of Democracy" and a foundation for the U.S. victory. After demobilization in 1945, commercial industry reverted to providing consumer goods to meet growing demand. The new machine tools and infrastructure purchased to support the war effort provided the means by which the U.S. maintained economic dominance and competitiveness for decades.[2] The need to mobilize the commercial economy again at the beginning of the Cold War sparked Congress and the Truman administration to re-establish the link to the commercial market through the enactment of the Defense Production Act of 1950. The resulting establishment of the Defense Priorities and Allocation System (DPAS) ensured that the U.S. government had access to civilian

[2] One of the more interesting findings found in Arthur Herman's 2012 book *Freedom's Forge* was the realization by Willliam Knudson (former president of General Motors) and those managing the industrial base conversion to defense work, that re-tooling U.S. industry "was more than just rearmament" but "a way to revitalize American business and industry" (p. 112) in anticipation of the post-war environment.

production to support the Korean War effort and future defense needs. This DPAS authority continues to be relevant today and was heavily used to ensure that commercial companies would prioritize and support the production of Counter-Improvised Explosive Device (IED) equipment and Mine-Resistant Ambush Protected MRAP) vehicles during the Iraq and Afghanistan conflicts (*Mine Resistant Ambush Protected,* 2007).

President Eisenhower's New Look policy set the stage for both the blossoming of a unique defense industrial base and the creation of new civilian commercial sectors in electronics, space, and computing. Defense research of the period led to many of the technological advancements that still serve as the basis for U.S. military might—Intercontinental Ballistic Missiles (ICBMs), nuclear powered submarines, advanced bombers, reconnaissance satellites, and the electronics and communications technology that support these major platforms. During the 1950s, the DoD provided a "path to commercialization" for a number of potential dual-use technologies (i.e., by serving as the lead customer for microelectronics purchases and for the Boeing 707 that served as the KC-135 tanker still in operation today). These purchases allowed companies to build up necessary capital and successfully demonstrate technology in order to expand in the commercial marketplace. The NASA manned moon landing program in the 1960s served as another mechanism to transfer technology to the commercial sector.

In the early 1960s, concerns about cost overruns on many of these newly developed and produced military programs ushered in a new management and oversight approach, to include the Planning, Programming, and Budgeting System (PPBS), a formal systems acquisition process, and the Truth in Negotiations Act of 1962 (TINA). The Vietnam War era saw the beginning of the bifurcation of the civilian and military industry bases and the development of barriers to commercial firms' participation in the DoD market. These barriers included the development of unique government procurement and oversight requirements, greater government control of intellectual property, unique security requirements, greater export controls, and a bias from the Pentagon against the use of commercial products. The latter was reinforced by the extraordinary technologies developed in the defense sector and the relative technological weaknesses of the commercial sector at the time. The result was a proliferation of unique military specifications.

For several decades, these two markets (military-unique and commercial) existed side by side with relatively little interaction. The defense industrial base supported the maintenance and evolutionary improvement of earlier weapon systems complemented by a few revolutionary, military-unique technological breakthroughs in the 1970s, such as stealth. Freed from its earlier military-centric and NASA-centric dependence, the computer and electronics industries began to develop technologies in innovative ways, as directed by the competitive pressures of the commercial market and the progression of Moore's Law.[3]

In 1980, aggregate commercially funded R&D in the United States overtook government-funded R&D and did not look back (American Association for the Advancement of Science, 2013). As this trend in private sector R&D intensified in the 1980s, defense policy-makers began to focus on ways to access this emerging source of innovation, especially as commercial products—from guardrails to TV monitors, data processors, and semiconductors—began to prove cheaper and more reliable than their military counterparts. For example, the Packard Commission found that commercial semiconductors were approximately an order of magnitude less expensive, were approximately two orders of magnitude more reliable, and were developed in less than 12 months, compared to the 17–51 month lead-time for military-unique components.

In 1986, President Ronald Reagan created the Blue Ribbon Commission on Defense Management, chaired by David Packard, a co-founder of electronics giant Hewlett Packard and former Deputy Secretary of Defense. While the stated goal of the Packard Commission was to identify methods to reduce inefficiencies in the defense procurement system, the Commission's focus ultimately turned to the problems embedded in the acquisition process and the elimination of barriers which had up to this point discouraged the DoD's acquisition of cutting-edge technologies. Foremost among its recommendations, the Commission called for the adoption of commercial processes and practices as a primary tool that the DoD could leverage to broaden its access to cutting-edge commercial products, services, and solutions.

To further bolster this position, the Packard Commission report cited a 1985 Defense Science Board (DSB) study that "compared typical DoD development programs with successful

[3] First articulated in 1965, Moore's Law states that the number of transistors on an integrated circuit doubles every two years.

programs from private industry." It used, as case studies, the development of the IBM 360 computer, the Boeing 767 transport, the AT&T telephone switch, and the Hughes communication satellite. Each of these programs were comparable in complexity and size to the development of a major weapon system; yet each took only half the time to develop, and cost concomitantly less (Packard, 1986). Earlier studies had also emphasized the importance of the DoD refocusing its efforts to increase its reliance on commercial products while decreasing its traditional dependence on government-unique specifications.

Unlike other Packard Commission recommendations, commercial item acquisition reforms did not begin in earnest until the early 1990s. In the 1991 National Defense Authorization Act (NDAA), Congress chartered the so-called "Section 800 Panel" to review and assess the efficacy of existing laws impacting the government's acquisition system.[4] The Section 800 report, published in January 1993 recommended a different approach to commercial items acquisitions, addressing both end items and components, and proposed the following:

- Adding language explicitly stating a preference for acquiring commercial and non-developmental items;
- Adding an expanded exemption in TINA for "adequate price competition;"
- Relieving the inappropriate requirement for cost or pricing data, in certain circumstances;
- Relieving "Buy American" and other socio-economic restrictions; and
  Limiting the applicability of technical data requirements for commercial items. (DoD Acquisition Law Advisory Board, 1993)

One of the most significant recommendations from the panel was the proposed addition of a new subpart in Title 10, United States Code (U.S.C.), specifically aimed at commercial items acquisitions. The proposal provided for exemptions from statutes that the panel had determined were barriers to commercial acquisitions, such as audit rights and pricing (DoD Acquisition Law Advisory Board, 1993). In its July 1993 report on *Defense Acquisition Reform*, the Defense Science Board supported the 800 Panel's recommendations and further urged their adoption.

1994 turned out to be a bellwether year for both regulatory and legislative initiatives aimed at encouraging the acquisition of commercial products by eradicating decades-old barriers that had

[4] The Section 800 Panel was chartered by Section 800 of the National Defense Authorization Act for Fiscal Year 1991, Pub. L. No. 101-510, § 800, 104 Stat. 1485, 1587 (1990). Interestingly enough, Congress had nothing to say about commercial items in the legislative history or founding of the Section 800 panel.

governed their use. Secretary of Defense William Perry's vision for streamlining and re-engineering the acquisition system was captured in a report entitled *Acquisition Reform: A Mandate for Change* (Perry, 1994a). The goals set by Secretary Perry (who had been a member of the Packard Commission) included the following:

- Integrate, broaden, and maintain a national industrial base sustained primarily by commercial demand but capable of meeting the DoD's needs;
- Acquire commercial and other state-of-the-art products and technology rapidly, from reliable suppliers that utilize the latest manufacturing and management techniques;
- Assist in the conversion of U.S. defense-unique companies to dual-use production;
- Aid in the transfer of military technology to the commercial sector;
- Preserve defense-unique core capabilities (e.g., submarines, armored vehicles, and fighter aircraft);
- Adopt the business processes of world-class customers and suppliers (including processes encouraging the DoD's suppliers to follow suit); and
- End the imposition of government-unique terms and conditions on contractors to the maximum extent practicable (Perry, 1994a).

Secretary Perry moved forward with internal DoD reform efforts when he issued a follow-on memorandum repudiating the use of inflexible military specifications that limited competition, stifled innovation, increased costs, and delayed the fielding of new systems (Perry, 1994b). The "Perry Memo" (See Appendix 2) overturned the DoD's traditional position on the use of military specifications by directing the services "to use performance and commercial specifications and standards in lieu of military specifications and standards, unless no practical alternative exists to meet the user's needs" (Perry, 1994b p.1). Focusing on semi-conductors, Secretary Perry concluded that military specifications for semi-conductors alone added one to two billion dollars annually to the cost of technology (Acquisition Advisory Panel, 2007). The future importance of commercial items to U.S. military strategy was outlined when then Under Secretary of Defense Kaminski (1995), testifying before a Senate Subcommittee, stated, "The military advantage goes to the nation who has the best cycle time to capture technologies that are commercially available; incorporate them in weapon systems; and get them fielded first."

Also in 1994, President Bill Clinton tasked Vice President Al Gore to lead the National Performance Review (NPR), an effort to improve federal management and execution. The NPR was built on past reform efforts, most notably the Grace Commission (chaired by J. Peter Grace;

The White House, 1984). As part of the NPR effort in 1993, President Clinton noted that of the top 10 semi-conductor producers, five refused to conduct business with the government because of the special procurement requirements involved to do business with the government ("Announcement by President Clinton," 1993).

The momentum behind commercial items acquisitions had been steadily building within the administration, but comparable efforts were wanting when it came to Congress. That chasm was breached with the passage of the Federal Acquisition Streamlining Act of 1994 (FASA)—ground-breaking legislation that coalesced a number of existing legislative proposals growing out of the Section 800 Panel's recommendations.

Two years later, Senator Bill Cohen and Representative Bill Clinger introduced and Congress passed the landmark Federal Acquisition Reform Act (FARA) as part of the FY 1996 National Defense Authorization Act (Pub. L. No. 104-106, div. D). FARA expanded FASA's scope regarding the preference for commercial items. The aim of Division E of Pub. L. 104-106 (Information Technology Management Reform Act of 1996) was to leverage commercial advances in information technology through the adoption of commercial best acquisition and management practices. FARA and the Information Technology Management Reform Act are collectively known as the Clinger-Cohen Act.

The passage of FASA and FARA radically modified the acquisition process by opening acquisitions to the commercial market and, thus, opening the door to the use of commercial industry components. In a 2006 audit report, the DoD inspector general's (DoD IG's) office identified the importance and benefits of commercial item acquisition to DoD, including

- access to state-of-the-art technology and products,
- savings on limited financial resources for research and development,
- establishment of a market price as a price analysis tool,
- integration of the defense and commercial industrial bases to benefit the nation's security and economy,
- reduced economic risk associated with developing new items,
- more rapid deployment of state-of-the-art technologies and terms,
- access to proven technological capabilities,
- increased competition (DoD IG, 2006).

FASA's potential for significant cost savings and acquisition streamlining bore fruit under a legislatively authorized pilot program. The Joint Direct Attack Munition (JDAM), a Defense Acquisition Pilot Project, provided flexibility and latitude because the government was following the FASA mandate of conducting acquisition programs more like a commercial business. The DoD studied industry best practices and returned with a clear understanding of the differences between the traditional DoD process and the processes employed in commercial industry. Commercial benchmarks became JDAM's project goals, which led to a successful outcome.

For the JDAM, the Pentagon estimated that adding fins and navigation sensors would cost approximately $40,000 per bomb, using the traditional approach of specifying the design and requiring military parts and production lines. However, rather than mandating that contractors follow the customary process, the DoD waived the detailed military specifications, granting companies the freedom to design the system, use off-the-shelf parts, and build the weapon as they would a commercial product. The final cost: $14,000 apiece versus the original $40,000 estimate, amounting to a total savings of approximately $3 billion (Office of the Deputy Under Secretary of Defense [Acquisition Reform], 1997).

Prior to the enactment of FASA, commercial companies had to decide if it was economically feasible for them to establish two separate business lines to segregate the military from their commercial business. Commercial products were simply not offered for sale to the government, due to the requirements for certified cost or pricing data, cost accounting standards, examination of records, and other government-unique requirements that added cost and business risk to the commercial business. FASA established a preference for commercial items over military-unique items and provided for a streamlined procurement path under FAR Part 12, to include commercially derived items used by the military.

As a result of FASA, many companies have technologies and product solutions that are offered to both commercial and military customers. The synergies of common solutions for both markets provide great benefits to the customers. Many of these companies (i.e., Honeywell, Harris, United Technologies, General Electric, and Rockwell Collins) are major players in both the civilian and military aerospace and information technology (IT) markets.

The ability to acquire commercial items has been an enormous asset to the warfighter. The statutory preference for the acquisition of commercial items and components enabled many technologies developed for the commercial marketplace to be used for military applications. The emphasis on market research enabled the government to look beyond the traditional "mil spec" suppliers and utilize proven commercial technology. An example is the USAF Global Air Traffic Management Program, through which the military procured a major avionics upgrade for the KC-135 tanker cockpit using display and navigation technology developed for the air transport and regional jet market. The decision to use commercial technologies rather than a military-unique solution resulted in a large cost savings to the USAF program. This would have been impossible to achieve under a FAR Part 15 acquisition method.[5]

The FASA statutory changes removed significant barriers to the acquisition of commercial items by the federal government, the underlying premise being that the government would use terms and conditions consistent with customary commercial practices. The terms and conditions applicable to commercial items included in FAR Part 12 (52.212-4) include a wide range of sales terms used across the commercial industry. Based on market research, these terms can be tailored for government acquisition of any particular commercial item. In most situations, these terms have been very successful by helping to define the contractual relationship between the government and the contractor. However, there is room for considerable improvement in the market research and tailoring process to ensure consistency with customary commercial practice.

Interest in pursuing additional commercial-type acquisition reforms led Congress to task the Government Accountability Office (GAO) with identifying commercial best practices for comparable types of DoD acquisitions. This was first done for systems' development and production, then for logistics and other services. A comparable exercise had been used to identify best practices for the purchase and use of information technology that served as the basis for the information management provisions of the Clinger–Cohen Act. Congress attempted to implement many of these best practices in subsequent National Defense Authorization Acts to provide management frameworks for both weapon systems and services acquisitions.

[5] Interview with authors.

Based on FASA reforms, commercial acquisitions became more prevalent and successfully implemented, according to numbers in the Federal Procurement Data System (FPDS):

> In 1996, DoD executed 475 contracts under the simplified commercial item procedures. By fiscal year 2011, commercial acquisition procedures were used for almost one-fifth of all the contracting dollars DoD obligated — nearly 13 million contracts worth almost $75 billion. Since 2005, DoD funds spent on those simplified acquisitions have more than doubled. (Serbu, 2012)

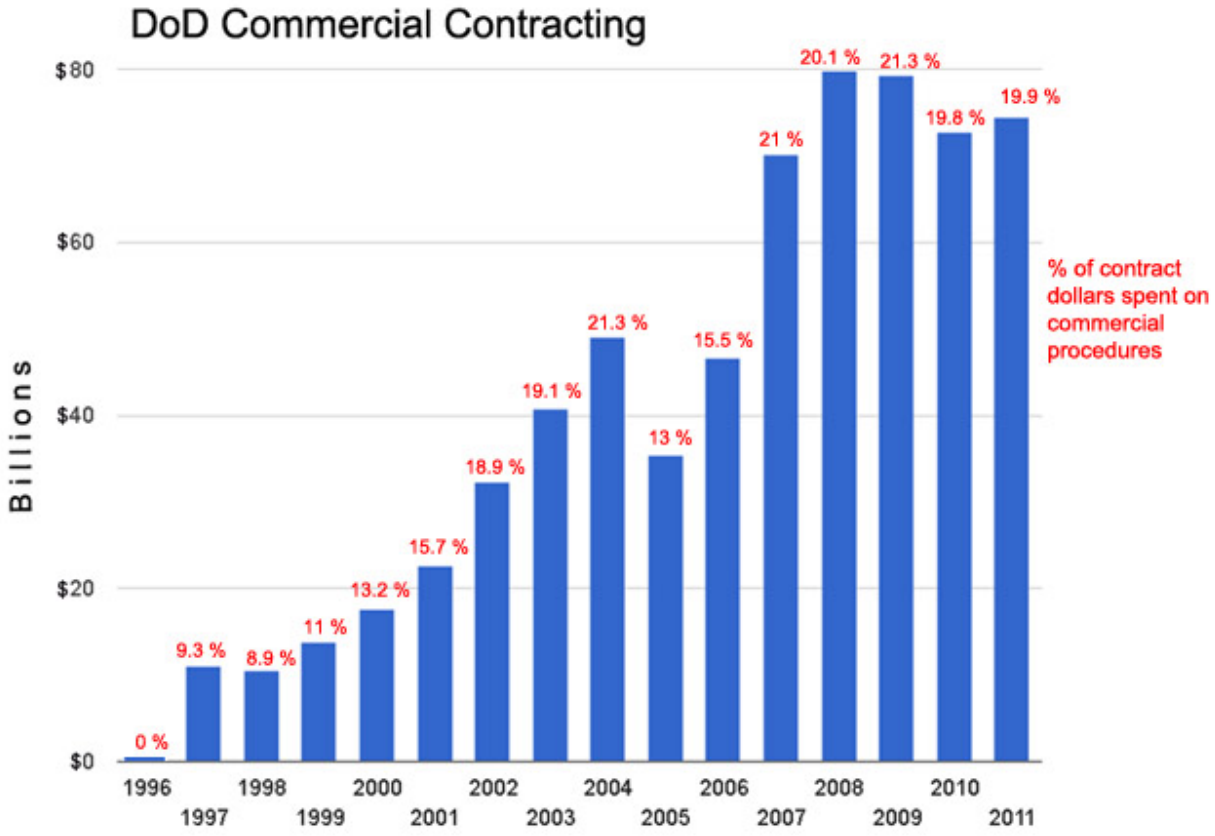
As a result of almost 20 years of acquisition reforms following the Perry Memo, commercial technologies have been rapidly embedded into DoD weapons and command and control systems. Government-unique prime contractors who we spoke with said that they would not achieve the cost affordability goals the government is setting without being able to access this commercial market. At first glance, this is a surprising finding, as it should be in the government-unique contractors' interest to get the government to pay them to replicate what is already out in the commercial marketplace. While this incentive does exist, contractors argued that the systems they develop would be too costly without incorporating technologies from the non-traditional commercial contractors and would not obtain initial funding.

Furthermore, these traditional companies were worried about trends at the DoD that are creating disincentives to the use of commercial contractors and the subsequent money-saving ideas and technologies. As one representative of a major defense contractor stated, "If DoD wants to go military unique we will do that but it will be at a higher cost."[6] Another senior official from a large defense-unique firm stated, "The problem is, we are seeing from the same DoD actors, not only pressures to 'spec' out commercial contractors but pressures to reduce overall price. The two policies are incompatible and could end up squeezing the margins of the traditional defense contractors and directly impact on the health of these companies."[7]

More will be said about the changing DoD environment for commercial items acquisition in Section V. The following chart shows the rapid increase in commercial contracting in the DoD since 1996, but also what could be an inflection point around 2009 as commercial item contracting began to decline at the DoD (Serbu, 2012).

[6] Interview with authors.
[7] Interview with authors.

Figure 1: DoD Commercial Contracting, 1996–2011 (Serbu, 2012)



III. Commercial Industries' Value to DoD

The DoD's ability to exclusively rely on a defense-unique industrial base is rapidly coming to an end.[8] While the potential ramifications of this unfolding reality have been debated since the Packard Commission, the business processes of the acquisition bureaucracy have not reflected nor adequately addressed this radical change in circumstances. R&D trends are generally reliable indicators of where future new ideas and products will surface. For the past several decades, these trends have been moving away from the DoD and the U.S. government, toward commercial and global markets.

At one time, the federal government and the DoD dominated R&D spending. For example, in 1964, the federal government provided 67% of R&D funding and served as the driver of innovation in the economy (National Science Foundation [NSF], 2012). Today, the private sector provides over 60% of U.S. R&D funding and accounts for over 70% of its performance gains (NSF, 2012). This trend was noticed in the 1980s, after the achievement of parity in R&D between the U.S. government and U.S. commercial industry, and was a significant catalyst for acquisition reforms in the 1990s. While support for commercial item acquisition may have waned in the DoD during an era of expanding budgets, the rationale for taking advantage of an even larger share of commercial R&D is now greater than it was when FASA and Clinger–Cohen were passed in the 1990s.

What is different about the last 20 years is that the relative significance of the U.S. global share of R&D is also declining. Just as the U.S. government no longer dominates U.S. R&D, the U.S. no longer dominates global R&D. In 2013, global R&D stood at around $1.5 trillion dollars, with the U.S. share at about 28% (Battelle, 2012). Thus, U.S. government R&D equals about 11% of global R&D, and U.S. private sector R&D is about 17% of global R&D. The globalization trend of the past several decades has seen a significant dispersion of R&D (see Figure 2) and changed the nature of private sector R&D, as firms opened R&D facilities in China, India, Europe, Brazil, and around the globe (DSB, 2012). The Defense Science Board recently described this trend:

[8] That is, if it wants to maintain its technological superiority and afford to modernize its equipment.

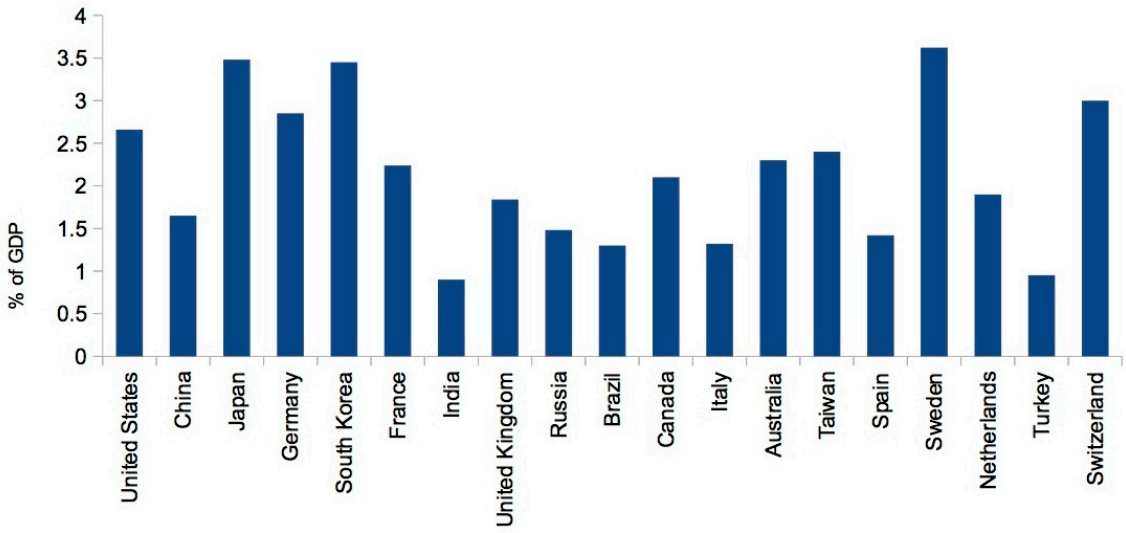
U.S. industry has long recognized the trend toward globalization of science and technology. Major corporations have approached the challenge to access the best ideas by going well beyond attending international meetings and reading publications. They have located research entities in strategic locales populated by a mixture of U.S. citizens and local scientists, and have populated research entities in the U.S. with the same mix.

For many companies, location matters less to their increasingly virtual-and global-workforce. This is equally true for small startups without the time or money to pursue work permits, but that do have access to shared virtual workspaces and overnight shipping. Virtual tools improve communication among researchers both across the campus and around the world. Many companies have found they can maintain around-the-clock progress on critical discoveries by handing off results across time zones as one shift leaves the lab and another arrives for work. (DSB, 2012).

Figure 2: R&D Expenditures by Country, 2013 Forecast (Battelle, 2012)

Country	R&D Expenditure (billions $US)
United States	423.7
China	220.2
Japan	161.9
Germany	91.1
South Korea	57.8
France	50.6
India	45.2
United Kingdom	42.4
Russia	38.5
Brazil	31.9
Canada	30.9
Italy	24.0
Australia	22.7
Taiwan	22.4
Spain	19.8
Sweden	14.5
Netherlands	13.5
Turkey	11.0
Switzerland	10.6

Figure 3: R&D Expenditures by Country, % of GDP, 2013 Forecast (Battelle, 2012)



While the global expansion of R&D has raised security challenges that will be discussed later in this report, the key question for the DoD is this: To what degree should the government replicate relevant global R&D? Absent open acquisition policies, the DoD risks allowing its potential adversaries to take advantage of a growing 89% of global R&D, while the U.S. government attempts to solely leverage an 11% share. The U.S. share may shrink further as federal budgets decline, due to budget austerity and R&D spending increases in the rest of the world. This is a game the United States will not win if it does not embrace the global R&D market. While the United States does maintain a cumulative technological lead from decades of aggregate expenditures of past R&D, it is by no means clear that other countries and commercial companies will not soon catch up and surpass current areas of U.S. technological dominance.

For security reasons, the United States could first try to leverage the R&D of its closest allies. For example, the combined global R&D share (commercial and government) of the United States, UK, Japan, Germany, France, and South Korea totals 55% of global R&D. But to access and create a true "allied" national security market and research network would require openness to commercial and global technology sharing heretofore unreachable due to U.S. security barriers and export controls. The limited Canadian exemption to the International Traffic in Arms Regulations (ITAR) and the special defense trade treaties with the UK and Australia were steps

in that direction, but unfortunately have not significantly reduced the barriers to defense cooperation in these three countries, let alone served as a mechanism to incorporate commercial technologies or create a seamless open defense market.

The U.S. government remains a vitally important player in global R&D, but it is important to ascertain where its R&D dollars are being spent. To take maximum advantage of internal R&D activities performed at government labs and R&D funded by the government but performed by the private sector, the government must ensure that these activities are not duplicating ongoing efforts in the commercial sector. A number of companies expressed great concerns that the DoD is susceptible to the "not-invented-here" syndrome, preferring items developed solely through DoD research, which is a prevalent attitude in the acquisition bureaucracy. On a number of occasions, commercial firms complained that U.S. government labs and government personnel find themselves in a conflicted situation by actively competing with, and replicating, commercial R&D in order to justify their budgets. If true, this replication has two costs—the costs of duplication and the cost of opportunities lost in the pursuit of R&D that could have been applied to other solutions. We found numerous commercial firms who believed that government personnel had no interest in looking for competing solutions to ongoing research "programs of record," even when those commercial solutions were readily available. Needless to say, in times of budget austerity, it becomes increasingly hard to justify any portion of defense R&D being spent on efforts that already exist in the commercial marketplace.

An obvious, but nonetheless important, point to emphasize is that the 60% of U.S. R&D spending being underwritten by the private sector is market oriented. Industry participants stressed that because of the underlying profit motive, these R&D efforts must have a path to commerciality. In the end, there must be a market for whatever product results from this R&D. Decades of competition and incremental advances produce products that people and firms want to buy in large enough numbers to justify production levels that, in turn, maximize a firm's profits. Some companies commit to longer term research, but, generally speaking, most commercial firms target a potential near-term market application.

It is hard to predict where the commercial marketplace will go in the future, except to say that ideas will continually be tested and demand for new products and services will rise and fall with

the demands of the consumer and the business judgments of firms that use these products to capture more business. The market is efficient in this regard, and while good ideas usually find their way to the top, some market "failures" could meet the needs of the DoD, and some market successes may fall short of meeting the DoD's needs. The DoD must have a robust market research capability that can identify good ideas in the commercial market, which could meet the DoD's needs while saving valuable R&D dollars and/or time to develop.

Still, the DoD's presence and relative buying power in many of these commercial markets is small. Total contracts let by the DoD in 2012 equaled $362 billion[9]—an amount that is equivalent to the GDP of Thailand. Expected declines in 2013 due to budget cuts and sequestration may take total contracts down closer to the GDP of Denmark which is $332 billion. And, while Denmark enjoys a dynamic economy, it dominates few markets. The same can be said about the DoD. There are a few military-unique markets that the DoD dominates with its purchasing power, but in other markets, the DoD is simply one of many customers.

Nowhere is this more evident than in the $3.7 trillion market for information technology (IT) (Gartner, 2013). This massive market can support high levels of R&D as the demand in the commercial marketplace for new solutions drives innovation. The DoD's market share for the less than $40 billion of IT bought annually[10] is about 1% of the global market, and even this purchasing power is diluted over a number of different IT market segments. In very few of these segments does the DoD exert much influence. The DoD is just another customer in this market and, from the perspective of many of these IT firms, "given its oftentimes unreasonable demands and legal requirements," it is not an attractive customer to pursue by commercial firms, whose business models do not lend themselves to customization.[11]

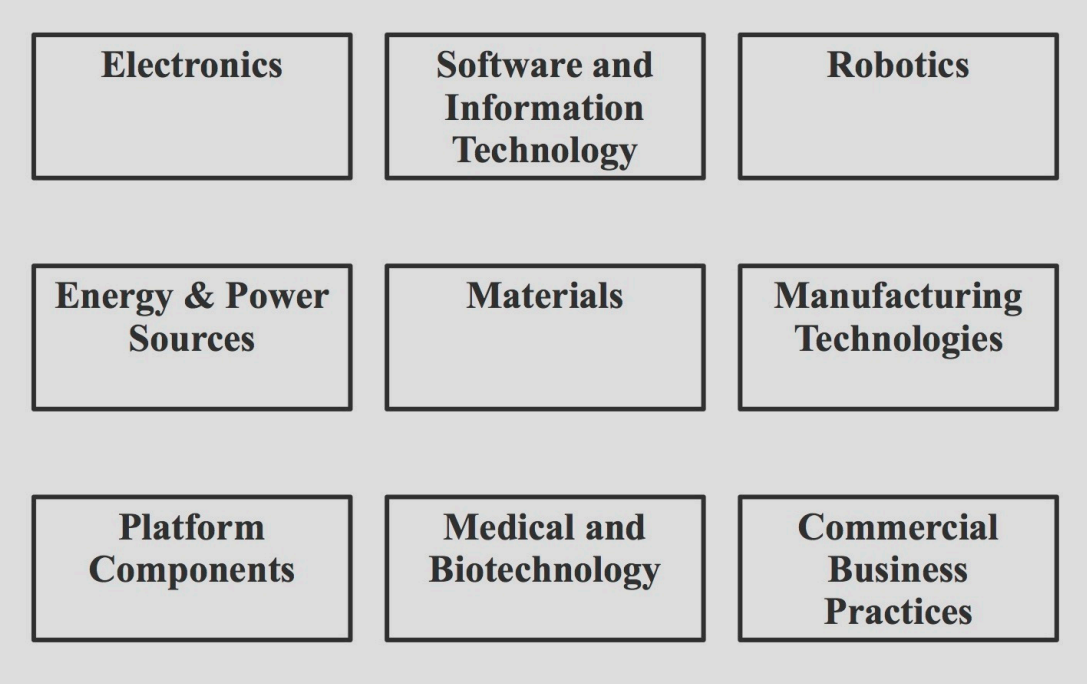
The DoD's primary leverage point is investing in dual-use technologies that the commercial market is not funding—because they are too risky, are too long term, or require a higher level of quality than other customers are willing to pay for. If the DoD were to take greater advantage of these investment opportunities and allow a path to commerciality, its ability to attract the "best and the brightest" engineers and firms would be significantly enhanced. If it does not decide up-

[9] See USAspending.gov for annual DoD contract spending numbers.
[10] For current DoD IT spending, see Federal IT Dashboard 2014 at www.itdashboard.gov, and for the 2013 budget, see Corrin (2012).
[11] Interview with authors.

front how intellectual property and export controls will be handled in a way that allows for a large commercial market to develop, it is doubtful that many commercial firms will agree to team with the DoD in developing solutions that address its more stringent requirements.

The IT markets that could potentially meet this test include 1) information security solutions; 2) counterfeit parts and secure supply chain solutions; and 3) developing data analysis tools to identify useful data out of large data bases and multiple data management systems. The following chart outlines some of the commercial industries that the DoD could potentially leverage in the coming decades by buying directly from these industries or directing R&D in areas that the commercial market will not fund due to the lack of sufficient, near-term commercial opportunities.

Figure 4: Commercial Technologies of Importance to DoD



Obviously, there are many other sectors that could be important and any such list will change over time, but each of these sectors has huge potential to be leveraged by the DoD. In the last 20 years, the IT industry (i.e., telecommunications, computer hardware, software, services) has been the primary focus of acquisition reformers. Advances in this sector will continue to outpace the ability of the DoD to replicate it. Efforts such as the DoD's "trusted foundries" or diminishing

manufacturing sources and material shortages" initiatives illustrate just how expensive and difficult it will be for the DoD to catch up with the market on its own.

Advances in networking and robotics -- creating new autonomous land, underwater, and flying vehicles -- will continue to find commercial markets. Industry officials we met questioned how the United States interprets its obligations under the Missile Technology Control Regime (MCTR) treaty, and many firms were concerned that this current restrictive U.S. position might encourage unmanned R&D activities to become concentrated overseas, as companies seek commercial opportunities. There was a concern expressed that unmanned systems could be susceptible to the experience suffered by the commercial space industry after its technologies were legislatively transferred to the ITAR control regime. Similarly, the night vision industry suffered when U.S. export controls limited the ability of U.S. industry to develop and compete for commercial opportunities. In each case, foreign competitors eventually took over commercial market shares to the detriment of U.S. companies.

There is a great incentive for commercial companies to reduce energy costs and apply commercial advances directly to DoD buildings, operations, and bases. The potential use of Energy Savings Performance Contracts (up to 25-year contracts authorized by Congress for this purpose) would allow the DoD to take advantage of new technologies as long as the DoD can commit to remaining in that location long enough to allow firms to capitalize their initial investments. However, the DoD's policies limiting the length of contracts make many of these solutions economically unfeasible in the DoD market, as firms cannot justify the up-front capital investment.

The DoD can also leverage other industries. For the military-unique aircraft, ground vehicle, space, and shipbuilding programs, there are corresponding commercial airplane and helicopter, automotive and truck, space, and shipbuilding industries. The ability to rapidly produce and field MRAPs during the Iraq and Afghanistan conflicts was a direct result of tapping into the capabilities of the commercial tire, automotive, and truck industries. Components and manufacturing techniques from many commercial segments could prove useful to the DoD. For example, General Dynamics' NASSCO shipyard, which builds U.S. Navy support ships, has revamped its shipbuilding operations by partnering with a South Korean firm and learning

commercial best shipbuilding practices, resulting in reduced costs and enhanced performance.

Many commercial firms are investing significant R&D efforts in materials research. The possibility of developing lighter, stronger, and less expensive materials for use in weapons platforms is a likely future trend. Advances in manufacturing technologies could potentially revolutionize the way platforms are built. The potential disruption from 3-D printing and its effect on spurring on other advances in more traditional machine tools and manufacturing technologies are yet to be felt, but will likely be significant and have military applications.

Some of the truly innovative cost-saving measures that the DoD can leverage are found in the services industries and in commercial industry business process improvements. Commercial business practices in logistics, transportation, inventory tracking, and other aspects of supply chain management can be emulated in the DoD, if it is open to such money- and time-saving ideas. Unfortunately, this is not an easy market for commercial firms to sell into. For example, one company developed a logistics tracking technology under a DARPA contract and has been highly successful in the commercial marketplace. However, with only a small number of intermittent sales to support contingency operations, the company had limited success breaking into the DoD market. This firm was subsequently acquired, and a decision was made to shut down the government side of the business and focus exclusively on commercial markets.[12]

[12] Interview with authors.

IV. Typology: What is a Non-Traditional Commercial Contractor?

The degree of imprecision in the definitions of a *commercial* or a *non-traditional* contractor leads to a significant amount of confusion, and possibly misguided policy choices. Sometimes, these phrases are used interchangeably and sometimes not. Depending on one's definition, there may be non-traditional defense and non-traditional commercial contractors as well as traditional defense and traditional commercial contractors. There are several ways to try to categorize the defense industrial base: by types of goods and services sales, by contracting mechanisms used, and by technologies that the DoD wants to buy. This section will attempt to explore some of these definitional issues.

As a starting point, it may be easiest to define traditional military contractors. While this could be an "I know it when I see it" exercise, even this is not so easy to do once one looks at the data. For example, the following chart (Figure 5) shows the top U.S. defense contractors by aggregate defense sales, including both U.S. and foreign defense sales.

From this data, most observers would consider Lockheed, Raytheon, and Northrop Grumman to be traditional defense contractors, based on their percentages of defense sales to overall sales. Thus, a beginning definition for a traditional defense contractor could be those firms with a high percentage of defense or government sales to total sales.

But what about Boeing, which is second in total defense sales but only 38.4% of its total sales are defense sales. Is it a traditional defense contractor? Well, yes and no. By most definitions, its defense unit—Boeing Defense, Space, and Security—would be a traditional defense contractor, but Boeing Commercial Airplanes ($49.1 billion in revenue in 2012), accounting for over 60% of Boeing's sales, would not be. Thus, within Boeing there is a traditional defense contracting entity and a primarily commercial entity. A similar situation exists at General Dynamics. While 66.7% of its sales are in the defense sector, its Gulfstream unit is primarily commercial. Focusing on business units or entities within companies may perhaps be the more appropriate way to analyze the industrial base.

Figure 5: Top U.S. Defense Contractors by Total Defense Sales, 2012 (Defense News, 2013)

U.S. Defense Contractor	Total Sales (millions $US)	Defense Sales (millions $US)	Defense Sales as % of Total Sales
Lockheed Martin	47182.0	44870.1	95.1
Boeing	81698.0	31372.0	38.4
Raytheon	24414.0	22705.0	93.0
General Dynamics	31513.0	21019.2	66.7
Northrop Grumman	25218.0	20603.1	81.7
United Technologies	57700.0	12117.0	21.0
L-3 Communications	13146.0	10845.5	82.5
SAIC	11200.0	8299.2	74.1
Huntington Ingalls Industries	6710.0	6240.3	93.0
Honeywell	37700.0	5089.5	13.5
Booz Allen Hamilton	5859.2	4798.7	81.9
Textron	12237.0	4283.0	35.0
Exelis	5522.0	4251.9	77.0
GE	147359.0	3978.7	2.7
Oshkosh	8180.9	3951.4	48.3
CSC	15000.0	3690.0	24.6
DRS	10972.5	3467.3	31.6
DynCorp	4044.3	3102.0	76.7
ATK	4362.0	3049.0	69.9
CACI International	3774.5	2944.1	78.0
Harris	5451.3	2796.5	51.3
Hewlett-Packard	119895.0	2637.7	2.2
Rockwell Collins	4726.0	2589.8	54.8
Bechtel	37900.0	2501.4	6.6
ManTech	2582.3	2463.5	95.4
General Atomics	2460.1	2460.1	100.0
Fluor	27577.1	1875.2	6.8
Jacobs Engineering	10893.8	1441.3	13.2
Navistar	12948.0	1000.0	7.7
AAR	2065.0	930.4	45.1
Wyte	1155.9	913.1	79.0
Cubic	1381.5	866.8	62.7
Accenture	27900.0	860.0	3.1
Moog	2469.5	857.1	34.7
Mission Essential	797.4	797.4	100.0
Curtiss-Wright	2097.7	779.5	37.2
Alion Science and Technology	817.2	748.4	91.6
Battelle	6100.0	688.0	11.3
FLIR	1405.4	619.2	44.1
Ball Aerospace & Technologies	873.3	603.0	69.0
ViaSat	1119.7	527.8	47.1
Day & Zimmermann	2400.0	346.0	14.4

There are several other companies that have large aggregate defense sales, but these defense sales are not the majority of sales within the company, such as United Technologies (21%) and Honeywell (13.5%). Companies that fall below the 10% threshold for the top U.S. defense contractors by DoD sales include Hewlett Packard at 2.2%, GE at 2.7%, Accenture at 3.1%, Bechtel at 6.6%, Fluor at 6.6%, and Navistar at 7.7%. These companies would be non-traditional companies, if one chose a definition of having a low percentage of defense sales to overall sales, but others might disagree, based on their having high overall aggregate defense sales.

Some of these firms have defense-specific units within their corporations, and creating stand-alone defense units seems to have become the standard way of organizing defense businesses for commercial firms. Many firms have chosen to structure themselves in a way that walls off their commercial side of the house from the defense business, with separate production lines and separate products for each line of business. So looking at subsidiaries (defense-unique and commercial) as a unit of measure, versus the firm, is one way of looking at this issue. However, other companies (like Rockwell Collins) have commingled commercial and defense production, or have attempted to standardize products across both the defense and commercial sectors, as much as possible. Comingling, or "civil–military integration," was one of the goals of commercial procurement reforms of the 1990s, and has been successful in a number of programs, but has been in decline as an organizational model since the DoD has modified its oversight of commercial items.

The benefits of civil–military integration are great. There was substantial cost to the DoD when, for example, Boeing Commercial Airplanes sold fully operational "green" commercial aircraft to its defense sector. Once flown to a Boeing defense sector facility, the airplane would be torn apart to modify it for military purposes, rather than making those modifications on the commercial line as is now taking place with the P-8 and the KC-45A tanker. This old, pre-FASA way of modifying commercial aircraft was done because of all of the unique military requirements the government imposed on commercial products.

In fact, Boeing used to coproduce commercial and military aircraft at its Wichita, KS, plant, but (for cost accounting reasons—specifically the requirement to allocate their research investment

[IR&D] based on the facility sales) they moved their production to California—and lost the economies of scale benefits to the cost of DoD aircraft. With the production commingling inherent in civil–military integration, a commercial entity (a part of a firm) or a commercial contractor (the entire firm) could have a large segment of government business but still be predominantly commercial in its outlook, operations, and business practices. This civil–military integration of production has been replicated for engines, avionics, aircraft, helicopters, information technologies, and other components in a number of firms.

A return to the old way of doing business by modifying the DoD's commercial aircraft in separate facilities would make these programs uneconomical in today's budget environment. However, several interviewees stated that the DoD's current acquisition oversight policies, in some sectors, are forcing commercial industry to consider re-establishing separate military and commercial facilities and production lines. Thus, because the DoD's production needs in many sectors are so much smaller than commercial ones, the equivalent process of "tearing up a brand new aircraft to militarize it" are being considered again in some sectors. Since the P-8 and the KC-45 are the largest defense programs that are using civil–military integration as an acquisition strategy, these programs could serve as a bellwether to watch trends in commercial contracting and the future of civil–military integration; but precisely because they are so big, these programs may get treated in a more favorable way than smaller defense programs.

Non-traditional commercial companies would be expected to have a small ratio of government sales to overall sales. Figure 6 includes a number of commercial contractors that could possibly be important to the DoD in the future, along with their current government sales percentages. The table also notes the profit margin for these firms, and many exceed the average of defense firms of 8% for goods and 5% for services, and a number of the firms exceed the regulatory contract maximum of 15%.

Most of these firms' defense sales are either non-existent or below 5%. The 2–5% threshold may be a good cut-off point to begin classifying firms, but there are a few firms such as GE and Hewlett Packard that would stand out in this criterion for their large aggregate sales. (In fact, they made the "Top Defense Contractors" list—see Figure 5.) For these firms, a further degree of analysis would have to look at how they are organized to do business with the DoD. GE has a

military engines component within its overall engine subsidiary, and that component could likely be defined as a traditional defense entity while the rest of GE's engine components, and the rest of the company, would be commercial entities.

Figure 6: Commercial Contractors by Government Sales, 2012[13]

Company	Govt. Contracts	Foreign Sales	Revenue (billions)	Net Profit Margin	Expertise
iRobot	15.10%	57.00%	$0.40	4.96%	Robots, artificial intelligence
CDW	10.00%	8.60%	$10.10	1.17%	Technology products and services for business, government and education.
CA Technologies	9.00%	42.00%	$4.80		Enterprise software
CH2M Hill (2011)	3.98%		$5.60	2.25%	Engineering, procurement, construction, and operations
Merck	3.00%	57.00%	$47.30	13.33%	Pharmaceuticals
Pitney Bowes	1.57%	31.00%	$4.90		Business software and hardware
Allegheny Technologies	1.36%	36.00%	$5.00	3.18%	Specialty metals producers
Agilent	1.14%	63.00%	$6.90	15.21%	Electronic and bio-analytical measurement instruments
Parker-Hannifin	1.06%	50.00%	$13.10	8.76%	Motion and control technologies
Jacobs Engineering	0.97%	38.00%	$10.90	3.48%	Engineering, construction
Caterpiller	0.77%	69.00%	$65.90	8.62%	Construction, power and energy systems
Xerox	0.77%	35.00%	$22.40	5.34%	Document/IT services
Johnson Controls	0.76%	63.00%	$42.00	2.92%	Buildings, automotive batteries, electronics, and auto interior systems
EMC	0.38%		$21.70	12.58%	Computer storage
Oracle	0.36%	51.50%	$37.10	26.89%	Data software, hardware
John Deere	0.25%		$36.20	8.48%	Agriculture equipments, turf
General Motors	0.25%	41.00%	$152.30	4.03%	Automobile
Chevron Chevron Chevron	0.22%	74.00%	$241.90	10.82%	Oil, gas, and geothermal energy industries
Avaya	0.21%		$5.20	-6.65%	Business communications and collaboration systems
Ford	0.20%	51.00%	$134.30	4.22%	Automative, financial services
IBM	0.20%	57.00%	$104.50	15.89%	Computer hardware and software
Microsoft	0.19%	92.80%	$73.70	23.03%	Software, services, and hardware
Cummins	0.13%	53.00%	$17.30	9.49%	Gas engines and engine-related component products
PPG Industries	0.12%	57.00%	$15.20	6.19%	Paints, coatings, optical products

[13] UMD Center for Public Policy and Private Enterprise research staff compiled data from annual reports, prime contract and subcontract data from USAspending.gov, and other sources for this table.

Company	Govt. Contracts	Foreign Sales	Revenue (billions)	Net Profit Margin	Expertise
Motorola Solutions	0.08%	42.00%	$8.70	10.13%	Data and telecommunications equipment
Symantec	0.08%	46.00%	$6.70	2.99%	Security software
Applied Materials	0.04%	80.00%	$8.70	1.92%	Semiconductor, TFT LCD display, glass
Thermo Fisher Scientific	0.03%	46.00%	$12.50	10.06%	Laboratory equipment
Illinois Tool Works	0.02%	50.00%	$17.90	13.92%	Manufacturing
Texas Instruments	0.00%	83.00%	$12.80	13.72%	Analog and embedded processing, amplifiers
Monsanto	0.00%	45.00%	$13.50	15.14%	Agriculture, seeds, genomics
Johnson and Johnson	0.00%	56.00%	$67.20	16.14%	Pharmaceutical, medical devices and diagnostics
Pfizer	0.00%	62.00%	$59.00	24.70%	Pharmaceutical
Abbot Laboratories	0.00%	60.00%	$39.90	14,95%	Diagnostics, pharmaceuticals
Eli Lilley	0.00%	65.00%	$22.60	18.09%	Drug manufacturing
Bristol-Meyers Squibb	0.00%	41.00%	$19.80	12.62%	Biopharmaceuticals
Owens Corning	0.00%	-70.00%	$5.20	-0.36%	Building materials, fiberglass
Apple	0.00%	63.00%	$156.50	26.66%	Consumer electronics
Amazon	0.00%	43.00%	$61.10	-0.07%	Online retailer
Google	0.00%		$50.20	21.40%	Internet, computer services
Cisco	0.00%	43.00%	$46.10	17.46%	Networking equipment
Western Digital	0.00%	77.00%	$12.50	12.92%	Computer storage
NetApp	0.00%	43.00%	$6.20	9.71%	Computer storage, govt exist but close out 2012
Emerson Electric	0.00%	55.00%	$24.40	8.06%	Electrical equipment
Goodyear Tire	0.00%	60.00%	$21.00	5.94%	Tire manufacturing
Qualcomm	0.00%	95.00%	$19.10		Telecommunications products and services
Jabil Circuit	0.00%		$17.20	3.63%	Electronics manufacturing services
Micron Technology	0.00%	85.00%	$8.20	-8.00%	Semiconductor devices
Broadcom	0.00%	97.00%	$8.00	8.44%	Semiconductors, electronics
Sanmina	0.00%	82.00%	$6.10	2.25%	Electronics manufacturing services
Advanced Micro Devices	0.00%	92.00%	$5.40		Semiconductors
C.H. Robinson	0.00%	11.00%	$11.40	5.22%	Multimodal transportation

Another way to identify the difference between a traditional and commercial contractor and entity is to look at the types of contracts employed. A traditional defense contracting entity would likely be covered by and comply with the Cost Accounting Standards (CAS) and a bevy of defense-unique business requirements. The non-traditional commercial entity portion of a firm would likely adhere to commercial accounting standards and practices.

The determination of whether a firm has CAS-covered contracts is the only definition of a non-traditional contractor in statute. It is found in Section 2302 (9) of Title 10, U.S.C., and addresses the application of the Other Transaction Authority (OTA) for prototype projects:

> The term "nontraditional defense contractor", with respect to a procurement or with respect to a transaction authorized under section 2371 (a) of this title, means an entity that is not currently performing and has not performed, for at least the one-year period preceding the solicitation of sources by the Department of Defense for the procurement or transaction, any of the following for the Department of Defense:
>
> > (A) Any contract or subcontract that is subject to full coverage under the cost accounting standards prescribed pursuant to section 26 of the Office of Federal Procurement Policy Act (41 U.S.C. 422) and the regulations implementing such section.
> >
> > (B) Any other contract in excess of $500,000 under which the contractor is required to submit certified cost or pricing data under section 2306a of this title.

This is a useful starting point as a definition for two reasons. The first reason is that this definition breaks a firm down into its business units by defining a contractor as an "entity." This typology should be more widely used than it is now as a tool for analyzing the industrial base because it distinguishes between units within a firm. The second reason that the Title 10 definition provides a foundation for defining a *non-traditional contractor* is by using CAS to distinguish between a traditional and non-traditional entity. If a business unit invests in CAS accounting systems, then it is probably committed to being a traditional defense contractor and has in place all of the compliance mechanisms to address government-unique oversight requirements.

However, subsection (B) of this definition quickly runs into problems and is probably too narrow for this research and for policy-makers. A large business unit in a commercial firm with no defense sales would cross this threshold with the award of a $500,000 competitive research contract. This was indeed the case with one interviewed Fortune 100 company that continually becomes ineligible for OTAs on an annual basis. For this reason, Congress should eliminate subsection (B) as a definition for a non-traditional contractor or, at a minimum, ensure that competitive R&D contracts are exempted from this definition (see more details on this below).

Trying to classify a firm in its entirety can be problematic given how companies have organized themselves to do business. Many firms (but not all) are aggregations of different profit centers that don't always have the same culture or business practices. This is especially true for those firms that have created stand-alone government subsidiaries to do government work. Thus, for purposes of a typology, it is better to break down each firm into its stand-alone subsidiaries. If a subsidiary has a high level of defense sales (admittedly an arbitrary threshold), a unique government accounting system, and CAS-covered contracts, that "entity" is a traditional defense contracting entity. If it doesn't meet those criteria, it is a commercial entity. If the commercial entity has a high level of defense or government sales, it can still be classified as a traditional commercial entity. If it has limited (e.g., 2–5%) or currently non-existent sales to the DoD, it can easily be classified as a non-traditional commercial entity.

Just to round out the classification system matrix, an entity such as a foreign defense subsidiary of a U.S. firm or a foreign-owned defense contractor with a large degree of non-U.S. defense sales could be labeled as a non-traditional defense entity. However, if the U.S. entity sold primarily to the DoD, it would be considered a traditional defense entity. For example, the UK operations of BAE would be a non-traditional defense entity under this definition, while its operations in the United States under its Special Security Agreement would be a traditional defense entity. Many global defense contractors that do little business with the DoD would likely fit into this classification (of non-traditional) and could be the sources of new technologies and a mechanism to capture overseas commercial technologies and R&D.

Figure 7: Typology of DoD Suppliers

Traditional Defense Contractor Entity	High % of defense sales; CAS
Traditional Commercial Entity	Low % of defense sales; no or limited CAS
Non-Traditional Defense Entity	Foreign located defense entity (high % of defense sales, limited U.S. defense sales)
Non-Traditional Commercial Entity	Limited (less than 5%) or non-existent defense sales

Another classification route is to use the different definitions in the FAR as to what constitutes a commercial item or service. Depending on the data, firms could be classified in accordance with the type of commercial item they sell or could sell to the DoD. Firms could also be classified based on sector, by percentage of sales to the DoD or the federal government, as a technology leader or follower, or by structure (whether they are purely commercial; predominantly a commercial firm that has established a unique government division; an integrated, diversified commercial/military contractor; or a commercial division residing within a traditional military contractor). In one firm, many types of entities could theoretically exist.

Once commercial entities have been identified, two further ways of classifying these entities could prove helpful to the DoD. The first is how the entity sells to the government, and the second is what the entity is capable of developing. The Defense Science Board, in its 2009 report on buying commercial, identified eight levels of commercial items (see Figure 8) that the DoD could buy.

Figure 8: DSB Levels of Commercial Contracting (DSB, 2009)

Level 1	DOD buys product from the original manufacturer and uses as is
Level 2	DOD buys product and makes minor modifications that don't affect functionality, such as painting the component a different color
Level 3	DOD buys product and makes significant modifications that affect functionality, such as adding armored doors to a vehicle
Level 4	DOD buys product from original manufacturer but specifies significant modifications in the purchase agreement which are made prior to delivery to the government
Level 5	DOD buys product based on existing product but replaces subsystems with military-specified parts
Level 6	DOD directs manufacturer or system integrator to modify prototype to fit needs
Level 7	DOD directs manufacturer or system integrator to assemble component parts on existing systems into a new system
Level 8	DOD purchases a product that doesn't yet exist, but uses commercial processes in development

Using these eight levels is a useful starting point in classifying commercial companies or commercial entities within companies. In addition, for each classification level, it should be noted whether an entity is prepared to sell directly to the DoD, or indirectly—only through an intermediary (a reseller or a traditional defense contractor). For example, a corporate decision may have been made to only sell COTS products to the government through a reseller.

However, the DoD may want to work directly with this entity to modify its product at Level 4, or the company may be capable of working with the DoD at a higher level but will not modify its business practices to be able to offer that level of effort to the DoD. In addition, each commercial entity would have two classification levels—one that shows its current status, and the other that is either a capability or aspirational status. Figure 9 illustrates those two levels for one commercial entity, such as Apple, which today is likely a Level 1 indirect provider; however, the DoD may aspire someday to have Apple working at Level 4 direct. Ultimately, the entire commercial industrial base of interest to the DoD could be continually assessed based on this classification system. This classification system could be useful in determining whether it is

worthwhile to reduce barriers to participation for those entities that have a large delta between current status and aspirational status.

Figure 9: Commercial Entity Classification Example

DSB Level	Direct	Indirect	Current Status	Aspirational Capability
1		**X**	**X**	
2				
3				
4	**0**			**0**
5				
6				
7				
8				

V. Challenges and Barriers to Commercial Acquisition

The respondents consistently emphasized the same general themes in their responses to the study questions. Many of the barriers to commercial contracting identified in the 1993 Section 800 Panel report (DoD Acquisition Law Advisory Board, 1993) still exist and continue to be relevant to the discussion. Since some of those issues were not subsequently addressed by either statutory or regulatory reform, and others were not effectively implemented, many respondents called for the Section 800 issues to be revisited by a new panel of experts.

Observers also said that they believed many of the positive reforms that were enacted in the 1990s have eroded in the last five years. In fact, there was a widespread belief that the paradigm for commercial contracting was being threatened from within the DoD. Until that trend is addressed, further commercial reforms will not succeed—they will be systematically thwarted by the DoD acquisition and oversight organizations. While the auditing and contracting communities received most of the criticism for this environmental change, there were also concerns raised about the DoD's technical requirements and security communities. However, principal grievances were leveled against the senior leadership of the Office of the Secretary of Defense and the military services, who are seen as lacking a clear understanding of the relationship between the defense acquisition system and the global industrial base, and who have not provided support for the acquisition of commercial items. In the absence of leadership advocacy and guidance, the nullification of the acquisition reforms of the 1990s is being allowed to take place.

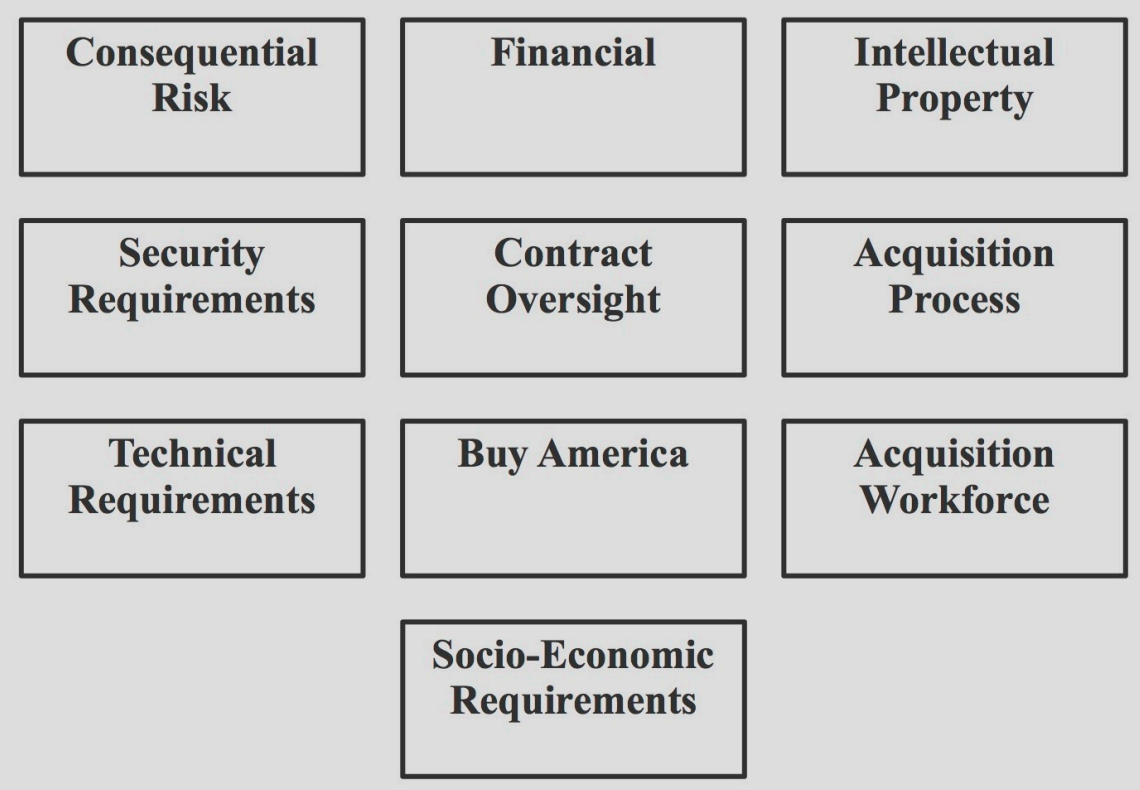
The barriers commercial contractors face when selling to the government can be grouped into the following three categories:

- openness of the market to commercial solutions,
- market risks, and
- unique government requirements.

The underlying environmental barrier or market openness will be addressed first, as it impacts other barriers to commercial contracting. The specific barriers inherent in market risks and

unique government requirements will be addressed in turn. Significant barriers to doing business with the DoD persist, and the cost of complying with the many attendant unique requirements continues to be borne solely by those being regulated. The following statement still rings true: "So confusing and time-consuming is the current legal and regulatory environment for defense acquisition that it suffocates its own reason for being: aiding the war fighter" (Business Executives for National Security [BENS], 2009).

Figure 10: Government Requirements That Create Barriers to Commercial Contracting



DoD Environment for Commercial Items

The openness of the defense market to commercial goods and services has declined significantly in the last five years. During this time, the DoD has seen a return of a culture of risk aversion and adversarial business relations with industry. This culture has been allowed to re-assert itself due to leadership signals from both Congress and the executive branch. Perhaps these signals have been misinterpreted by the DoD's acquisition workforce, and some of the lessons learned from past procurement scandals have been misapplied across the board. Whatever the reason,

the pendulum has radically swung back from the acquisition reforms of the 1990s. It is unclear whether leadership truly envisioned the degree of this shift and that these policies were the expected outcomes derived from issues related to wartime contracting and the proposed Air Force tanker lease. Regardless, without a new, significant leadership intervention, a return to the pre–FASA-reform industrial base and many of the acquisition problems the DoD faced in the 1980s may be inevitable.

The Section 800 Panel observed the changes taking place in the industrial base in the early 1990s —changes that are remarkably similar to those occurring today. The biggest exceptions are that the unique defense industrial base is considerably smaller and less competitive today than it was in the 1990s, and the globalization of the supply chain had yet to take place on a grand scale two decades ago.

> Operation Desert Storm demonstrated that an industrial base built around the global requirements of the Cold War had the capacity to respond to the demands of a regional conflict. However, as a study by the Air Force Association noted, this industrial base "no longer exists." This exodus from the defense marketplace was not solely due to the downturn in defense spending: "Firms, particularly subcontractors and suppliers of system components, are moving from defense to the commercial market, where the profits are better and where business is conducted in a more stable, less adversarial manner." (DoD Acquisition Law Advisory Board, 1993)

There was a similar refrain from today's industrial base. The boards of directors of many commercial firms are currently debating whether the defense market is worth the risks for such limited gains. From industry's perspective, the breakdown in industry–government communications, adversarial relations, and distrust that the government will do the right thing, may well be the worst seen since the advent of acquisition reforms in the early 1990s. This issue is extremely troubling and is one that will impact more than just commercial item contracting.

Adversarial relations with industry begin with government employees' and political leaders' views toward industry. Do these employees believe industry is a potential partner to help solve problems the government cannot, or do they believe industry is trying to "rip the government off" any chance it can get? It is the latter view that has prevailed since senior leadership set the

tone with President Obama's speech on federal procurement in March 2009 (The White House, 2009) that is referred to by some in the defense industry as the "culture of corruption" speech.[14] While it is not clear that the President was targeting more than a small subset of acquisition issues related to wartime contracting abuses, the application of his concern has been much wider than the limited number of overseas contracts that have been winding down as the United States extricates itself from Iraq and Afghanistan. For better or for worse, this speech, and the policy memos issued as a result, have established an atmosphere of distrust for the procurement community resulting in adversarial relations with industry, a return to government-unique oversight mechanisms (that are not applicable to commercial contracting), a reinstatement of government-unique requirements, and a prevalent culture of risk aversion.

Each of these traits was embedded in the procurement and oversight community prior to the enactment of FASA. The change in culture necessary to disable these traits required that federal leaders provide the encouragement and political support for the acquisition community to exercise the necessary discretion and sound business judgment in order to get the best deal for the DoD. In retrospect, we can see that this culture change was never fully achieved at the DoD. As soon as the opportunity arose, advocates for more prescriptive policies were able to reaffirm and reinstate these older policies. In hindsight, it is obvious that the efforts of a few tradition-bound players led to actions to block the option to tailor policies to fit the situation. One-size-fits-all solutions and the elimination of discretionary authority on behalf of the acquisition community are making a comeback. As one former senior DoD official stated when asked about some of these one-size-fits-all policies, "This is because of the growing inexperienced workforce." The new workforce replacing older retirees as they leave the DoD "cannot be expected to exercise that level of discretion."[15]

In fact, currently, 55% of the DoD acquisition workforce has only five years of experience—and most of the senior, potential mentors have retired; for example, in 1990, the Army had five

[14] Actually what the president said was, "The days of giving defense contractors a blank check are over," as well as, "But I reject the false choice between securing this nation and wasting billions of taxpayer dollars. And in this time of great challenges, I recognize the real choice between investments that are designed to keep the American people safe and those that are designed to make a defense contractor rich." His comments about waste, fraud, and abuse in defense contracting were interpreted by Danielle Brian, executive director of the Project on Government Oversight, who was quoted in the Washington Post the day after the speech as saying that "by giving this speech, President Obama has highlighted the **culture of corruption** (emphasis added) in contracting in Washington and is embracing the necessary changes to fix it." (Wilson, Scott and Robert O'Harrow Jr.)

[15] Interview with authors.

general officers with contracting experience, while in 2009, it had none.

Commercial contracting requires the exercise of discretion and involves some calculated risk. It simply cannot survive in a risk averse environment. A major factor contributing to the DoD's apparent departure from commercial products acquisition in favor of the old way of doing business is the return to an entrenched cultural aversion to risk. This mindset appears to be based on the following:

- lack of training and guidance on how to conduct a commercial procurement;
- fear of making mistakes and suffering the potential (or perceived) consequences (i.e., testifying before Congress; being a featured player in a case of waste, fraud, and abuse; and/or derailing a government career and/or possibility for promotion); and
- ingrained distrust of industry leading to a habit of keeping "an arm's length distance" relationship with contractor counterparts.

In describing the overarching DoD environment in one program (one that is relevant to many others in the Department), the Institute for Defense Analyses (IDA) found, "The culture does not encourage delegation of authority to make binding decisions at the minimum level possible. This results in slow decision-making and decisions being revisited" (Ketrick, Paul K. et al., 2011).

A series of additional events over the last decade has also contributed to the undermining of the commercial item consensus in DoD. The first was budgetary. The increase in defense spending since September 11th shifted the focus of the Department from an emphasis on saving money in a downturn by using commercial products and practices to one of addressing the exigencies of contingency operations in Iraq and Afghanistan. At least in the more traditional acquisition programs and day-to-day operations of the Department, budgetary pressures were eased, and finding commercial solutions became less and less important. Ironically, the need to get solutions out to the field faster enhanced the participation by non-traditional contractors in rapid acquisition initiatives, such as counter-IED, surveillance, and MRAP vehicle programs. However, these rapid deployment programs may become casualties of the new acquisition environment, as the United States withdraws from operations in Afghanistan and Iraq.

The Darleen Druyun scandal, uncovered during a congressional investigation into the proposed sole-source Boeing tanker lease in 2003, undermined support in Congress for some commercial item procurements. As the original appropriations language specifically defined the Boeing tanker as a commercial item, this commercial item exemption was interpreted by some as a way for more traditional contractors to avoid the acquisition oversight process. A similar effort by the Army to use an OTA for development of the Future Combat System (FCS) and the Air Force commercial item contract for C-130Js convinced many that commercial item reforms had gone too far. On the other hand, the use of a commercial 767 aircraft as the basis for the tanker, the ability to access commercial robotics companies for the FCS, and the encouraging of Lockheed to invest its own money into upgrades to the C-130J, similar to a commercial aircraft company, could make a case for using some of these authorities. Rather than a blanket skepticism of those authorities, perhaps the key question that should have been asked is "To what extent did the use of commercial item authorities by the government make sense, and what level of authority would be appropriate to use in these cases?"

Another concern about insufficient justifications for commercial item procurements was raised in a 2006 DoD IG report. Subsequent DoD concern about potential "high" profit margins for some commercial procurements bought under the "of a type" definition of commercial items, as compared to more traditional defense contracts, led the administration in 2012 to support a legislative proposal to eliminate the "of a type" definition from the statutory commercial item definition. While Congress rejected the DoD's request, the Senate did express concern over the narrow issue of sole source spare parts buys:

> The Administration requested legislation that would amend the definition of commercial items in section 103 of title 41, United States Code, to exclude items that are merely "offered for sale" or "of a type" offered for sale in the commercial marketplace. The committee declines to make this change. The Federal Acquisition Streamlining Act of 1994 (FASA) (Public Law 103-355) adopted a broad definition of commercial items to ensure that federal agencies would have ready access to products that are available in the commercial marketplace—including new products and modified products that are just becoming available. Such access remains particularly critical in fast moving commercial markets, including the markets for information technology and other advanced products.

> At the same time, the committee shares the Administration's concern that some contractors have abused the commercial item definition to obscure cost and price information with regard to spare parts and components for DoD weapon systems. As DoD has pointed out, the Government Accountability Office and the DoD Inspector General have both criticized the Department for using commercial item procedures to procure items that are misclassified as commercial items and are not subject to competitive price pressure in the commercial marketplace. (S. Rep. No. 112-173, (2012)

The Senate then included a provision in its 2013 NDAA bill to authorize the DoD to require contractors to provide additional data, including certified cost or pricing data, when necessary to evaluate the price reasonableness of certain commercial items that are procured for the support of a major system (S. Rep. No. 112-173, (2012). In reviewing the Senate proposal, however, the conference committee came to the conclusion that existing law in Title 10, U.S.C.,

> sections 2379 and 2306a (d) provide the Department with the authority that it needs to obtain price information and uncertified cost information, when necessary to evaluate the price reasonableness of commercial items. The inconsistent use of this authority by the Department appears to have created uncertainty in the vendor community without assuring reasonable prices. *Conference Rep. No. 112-705, (2013).

The conferees asked the Department to issue guidance "to address these problems" Conference Rep. No. 112-705, (2013).

Still, the desire for this language by the DoD has sent a signal throughout the acquisition community that commercial item procurements are now riskier and no longer the default options, despite the language in FASA. This transcends potential overcharging on a few sole-source spare parts buys (that was of concern to the Senate) and is being applied DoD-wide. There appears to be a growing bias in the DoD to look toward military-unique suppliers so that the government can validate their costs and add a "reasonable" profit to that work, versus paying less for commercial items without detailed knowledge of the underlying costs or profit margins of commercial contractors. Accepting higher commercial margins in exchange for a lower price was the basis for the "buy more with less" reforms of the 1990s.

Today, instead of being rewarded for getting a better deal on price, a procurement official may

be questioned if a contractor's profits appear to be too high. It doesn't take long for a DoD acquisition official to understand that the auditors will not question them if they are working on a CAS-covered contract with a military-unique contractor, versus a commercial one, even if comparable prices for the CAS-covered contract are higher. Thus, the entire rationale for commercial contracting is under threat from within the DoD, ironically, by those who are supposed to be charged with ensuring that the DoD gets more for its money. This might be an ease-of audit issue, as it is much easier to audit a government-unique CAS standard than it is to determine a reasonable price in the commercial market. But the audit community must be directed to establish audit criteria that, even if more difficult, are less intrusive and don't drive commercial firms and practices away from the DoD marketplace. Current audit criteria and policies of the Defense Contract Audit Agency (DCAA), the DoD IG, and the Defense Procurement Acquisition Policy (DPAP), and the application of this criteria in a one-size-fits-all basis are significantly responsible for overturning the commercial acquisition reforms of the 1990s in practice. These organizations should consider the long-term ramifications of their oversight efforts in terms of less innovation, greater costs, a narrowing of the industrial base, and lower competition.

Given these trends, the current defense acquisition environment for commercial items is worse than it has been since the advent of acquisition reform in the 1990s. There does not appear to be an advocate in senior leadership, as there was in the 1990s, when commercial acquisition reforms were driven from the top by Secretary of Defense William Perry, who brought to the Office of the Secretary of Defense (OSD) a unique background in electronics, defense, and finance. Without this top-down support, each of the acquisition stovepipes will tend to maximize the interest of their areas of responsibility and potentially sub-optimize the acquisition process as a whole.

Consequential Risks

As commercial contractors weigh the pros and cons of doing business with the government, they must consider potential consequential risks that arise out of a direct federal contract. These monetary and compliance risks would have a direct and significant impact on a company's or

brand's reputation, if they were caught up in a civil and/or criminal liability or possible suspension and debarment proceedings. Given the current environment, and the adversarial relations between government and industry, these risks are now higher.

Each federal contractor must weigh the costs associated with the countless compliance requirements imposed upon government contractors—many of which will still apply to those firms even if they are only selling COTS items directly to the government. Traditional government contractors will have already made the necessary investments in building a formalized compliance program staffed by an internal bureaucracy. Commercial contractors seeking entry into the government market must establish a compliance baseline to meet these requirements—a monumental effort requiring a concomitant investment of corporate funds. Contractors must either develop best practices for mitigating collateral risks, and be prepared to demonstrate to the defense agencies (i.e., DCAA/DCMA) their compliance with government contract requirements, or expose the company to monetary and/or reputational penalties.

A company must exercise due diligence in assessing the unlikely but nevertheless possible impact of becoming entangled in a case of non-compliance with some obscure federal acquisition requirement. A relatively minor oversight or misstep may quickly escalate into blaring press headlines, civil or criminal penalties, a loss of corporate credibility, and a major blow to the company's brand. Is the prospect of winning a government contract worth the hefty upfront investment in compliance risk mitigation? Can one afford to forfeit the company's otherwise stellar reputation as a commercial company, as a consequence of an employee's unintended mistake on a government contract? Many COTS firms have decided that for the majority of their products, this risk is too great. They have turned to resellers to gain them some semblance of protection from these potential liabilities. This is a logical step toward completely eliminating their interactions with the U.S. government and the DoD.

One senior Washington Office industry representative said that justifying staying in the federal market is a daily sell to his corporate leadership and that "they keep asking why I am spending 80% of my time on problems [with federal contracting] that only represent less than 1% of our

business."[16] In these instances, many problems arise from firms' efforts to provide the U.S. government with more alternatives than just COTS (i.e., modifying their commercial product to meet a unique government requirement). However, some firms have made the decision that modifying their products for government applications is simply not worth the attendant headaches. In addition to the compliance burden, the added costs of modifying a commercial product to meet the government's requirements will impinge upon a contractor's ability to meet its business goals and stockholder expectations.

Financial Barriers

A clear understanding of the commercial marketplace and the financial institutions that underpin those markets is necessary to gain insights into the challenges that face commercial contractors dealing with the DoD. Firms and individuals risk their capital, engineering talent, and expertise on a certain outcome, and expect a competitive rate of return for taking that risk. Managers who do not make a profit are replaced and firms that don't make a profit eventually shut down. The expectation of achieving comparable profit margins in the defense market to their realized commercial margins, clearly impacts the calculations of commercial contractors as to whether to enter that market.

The first financial barrier for commercial firms is the ability to obtain financing to start a business in the federal market. Representatives of the financial community (private equity, venture capital, Wall Street analysts, and banks) had very few positive things to say about the federal marketplace—profits are too low, risks are too high, markets are non-competitive and locked up. Many firms described the financial capital environment as one that enforced a need to pay out investors in a 3–5 year time frame. Expected government contracting returns simply do not generate the revenue or response times that would interest most venture capitalists.

A few Silicon Valley entrepreneurs funded one emerging contractor when it could not obtain venture capital funding. This was described as a way of proving that government contracting could be done profitably. While this company has been successful in winning contracts, it is by

[16] Interview with authors.

no means certain that the company will make the type of returns that most Silicon Valley firms are expected to make. Further, the company is now branching out into the commercial market where returns are greater.

Banking institutions do not seem interested in lending until a signed contract is in hand, and even then, there are no guarantees, as "even with a signed contract, banks like to see independent equity investors risking their capital first" before lending.[17] Given the lengthy procurement process, firms would be expected to self-finance during any start-up period, an option that may be well beyond the financial means of most firms, particularly new, small commercial businesses.

Even those larger commercial companies that have made the decision to internally invest the capital needed to break into the defense market often leave disappointed. A consultant recalled one of his clients saying, upon leaving the defense business, "money can't wait." The inordinate time required for the DoD to make a procurement decision is sometimes too long for firms to tie up their money while waiting for a decision. Budget uncertainties (the threat of sequestration and government shut downs do not represent a tempting business environment), the incessant search for information necessary to respond to requests for information (RFIs) or draft requests for proposal (RFPs), and the lack of new programs on the horizon, increase the uncertainty.

Even for those firms that have successfully obtained development contracts, the ability to transition to a real program is getting harder and harder, as the "valley of death" (the time between development and program initiations) is getting wider and wider. There is a fear among contractors that the DoD is stringing them out. There was also an expressed concern that the services are increasingly protecting their organic capabilities, as more and more programs are stopped short of competitive opportunities. To some it appears that the government seems to be using the pre-solicitation phases as an information-gathering exercise to support its organic work. This information collected from industry appears to be passing to the service laboratories and depots who then undertake the efforts. Those firms that have been successful in rapidly transitioning capability to the war effort in Iraq and Afghanistan face limited opportunities to be

[17] Interview with authors.

funded for long-term sustainment or transitioning to a larger force. These capabilities will likely be lost if not funded. Oftentimes, firms face a bundling of requirements that only a prime could win. In this situation, a company must face the hard decisions of choosing the right teammate and trying to assess whether that teammate will actually subcontract work or choose to do the work in-house.

These market risks, combined with *customer risk* (a euphemism for the DoD's poor business practices), are extremely high for many firms. The financial community has a great understanding of these risks and will lend or invest accordingly. When taken in tandem, market risks and the perception that the DoD is seeking ways to drive margins down, make the government market even less attractive to private financing which, in turn, creates even larger barriers to commercial companies entering the DoD market. While profit concerns are generally focused on traditional defense contractors, non-traditional contractors' views of the market make these trends relevant. Thus, the perceived issue of the DoD's "war on profits" needs closer scrutiny.

As provided in the FAR, federal acquisition policy expressly recognizes the importance of the contractor's ability to earn reasonable returns on business with the government, stating: "It is in the government's interest to offer contractors opportunities for financial rewards sufficient to stimulate efficient contract performance, attract the best capabilities of qualified large and small business concerns to government contracts, and maintain a viable industrial base" (FAR Part 15).

The FAR goes on to state,

> Both the government and contractors should be concerned with profit as a motivator of efficient and effective contract performance. Negotiations aimed merely at reducing prices by reducing profit, without proper recognition of the function of profit, are not in the government's interest. The negotiation of extremely low profits, use of historical averages, or automatic application of predetermined percentages to total estimated costs do not provide proper motivation for optimum contract performance. (FAR Part 15)

The FAR language is explicit and unequivocal. Nevertheless, there are abundant examples of recent acquisition trends and policies that have attacked the profit and fee portions of traditional defense contractor's prices, either through the elimination of fees on certain cost elements or by

negotiation strategies impacting overall returns on government contracts. In addition, proposed policy changes that are aimed at forcing business system improvements and delaying fees until contract completion would significantly impede government contract cash flow, a critical part of the value proposition when doing business with the government. Finally, for R&D, acquisition policy trends now tend to favor cost-share, no-fee, or firm-fixed-price contracts, making full compensation for the development of government-unique technologies virtually impossible. The combination of lower margins in development, a higher percentage of development programs compared to full rate production, and the uncertainty of capturing higher margins in the production phase is increasingly making defense an unattractive market.

DoD acquisition officials have emphasized repeatedly that they are not looking for ways to impact contractor profitability—just their costs. One DoD procurement official said that the Pentagon is concerned with cost reduction, not margin reduction, and that he would be surprised if profitability went down, even as spending is decreased. He stated, "It wouldn't bother us at all if operating margins go up, so long as we're paying less. We want to spend 90 and have them make 15, we don't want to spend 105 and have them make 15" (Fryer-Biggs, 2011).

Despite protestations from senior DoD executives that they are not striving to marginalize profits, representatives from the traditional defense industry believe acquisition trends focused on elements of profitability, including changes to contract cash flow and policies for R&D funding, will have negative consequences for the government and the industrial base as contractors and investors shift resources away from unprofitable government business.

Industry has repeatedly expressed its concerns to the DoD about attempts to drive down costs by arbitrarily reducing elements of cost and corresponding profit. Squeezing profits undermines industry's ability to invest in new technologies. As with other industries, defense contractors must compete in the marketplace for labor, capital, and other resources. Maintaining a fair return on its contracts allows industry to compete for needed resources, provide economic value to its investors, cover legitimate business costs that are not recognized as allowable by the government, and continue to provide its customers with quality products. Even more applicable to this study is that these defense-unique returns serve as a baseline benchmark and data point for rates of return that commercial firms would be expected to obtain in the defense market.

Overall, the defense industry's profitability lags significantly behind its industrial peers. In February 2009, the Institute for Defense Analysis (IDA), under contract to the DoD, released a report entitled *Defense Department Profit and Contract Finance Policies and Their Effects on Contract and Contractor Performance*, which found that the margins for the defense industry were lower than for companies in other sectors.

A recent comparison of company margins depicted in Figure 11 reinforces this trend. Defense industry margins are lower than comparable capital goods industries, although they did better than the auto industry in its run up to its recent financial difficulties. Defense services contractors seem to have similar, or at times, even a bit higher margins than their commercial counterparts. Still, if the DoD seeks to attract commercial expertise, it must be noted that margins in the information technology industry and other commercial sectors are much higher than in the defense or capital goods sectors.

What is most important about these numbers is that the DoD is likely going to have to pay at this higher level in order to gain, or maintain, the interest of the commercial contractors. If it is not willing to accept double-digit margins in some industry sectors, then it will likely not get the benefits of those firms' technologies, products, or expertise. The perception by industry that the government has embarked on a "war on profits," even if it is only against traditional defense contractors, will have a cost. This perception is widespread and contributes to the conclusion in the financial community that the defense market is not a good market to invest in for new entrants. Addressing this perception is necessary to avoid rapidly limiting the DoD's available supplier pool and altering, to some measurable degree, the quality of the products they will be able to buy.

Figure 11: Defense and Related Industry Profit Margins, 2007–2012[18]

	2007	2008	2009	2010	2011	2012
Defense						
Boeing (BDS)	0.00%	0.00%	9.80%	13.10%	9.90%	9.50%
CACI	7.50%	6.70%	6.60%	6.20%	7.00%	7.90%
Gen. Dynamics (ex. Gulfstream)	10.30%	11.10%	11.10%	11.40%	11.60%	8.50%
Huntington Ingalls	7.90%	2.20%	3.40%	3.70%	1.70%	5.50%
ITT Defense/Exelis	12.80%	11.30%	11.60%	11.00%	7.60%	10.30%
L-3 Communications	10.40%	11.30%	10.60%	11.20%	10.50%	10.30%
Lockheed Martin	11.10%	12.50%	10.10%	9.40%	8.90%	9.20%
Mantech	7.90%	8.20%	8.90%	8.30%	7.90%	6.70%
Northrop Grumman	10.00%	7.90%	8.20%	10.00%	12.40%	11.50%
Raytheon	10.90%	11.30%	12.20%	10.40%	11.50%	11.90%
SAIC	7.40%	7.60%	7.90%	8.70%	2.90%	5.70%
Mean	**8.70%**	**8.20%**	**9.10%**	**9.40%**	**8.40%**	**8.80%**
Median	**10.00%**	**8.20%**	**9.80%**	**10.00%**	**8.90%**	**9.20%**
Capital Goods						
Caterpillar	10.90%	8.70%	1.80%	9.30%	11.90%	13.30%
Cummins	8.90%	8.90%	6.30%	12.10%	14.90%	13.50%
Danaher	15.80%	14.70%	13.70%	16.30%	16.30%	17.20%
Dover	13.70%	13.60%	10.20%	15.20%	15.20%	15.40%
Eaton	8.80%	8.40%	3.70%	8.50%	10.20%	11.70%
Emerson Electric	15.80%	16.50%	13.30%	14.90%	15.90%	16.60%
Flowserve	10.90%	13.80%	14.40%	14.40%	13.70%	14.40%
Honeywell	13.50%	13.30%	13.30%	13.90%	14.70%	14.40%
Illinois Tool Works	16.50%	14.60%	10.00%	15.30%	15.40%	16.20%
Ingersoll-Rand	12.10%	8.60%	6.70%	9.00%	10.20%	10.70%
Joy Global	18.60%	16.10%	19.50%	19.80%	20.90%	21.20%
Lennox	7.20%	6.40%	3.80%	6.10%	4.50%	7.70%
Parker Hannifin	11.40%	11.90%	8.10%	8.70%	12.10%	13.00%
Rockwell Automation	16.40%	15.10%	7.90%	12.60%	15.50%	16.40%
Mean	**12.90%**	**12.20%**	**9.50%**	**12.60%**	**13.70%**	**14.40%**
Median	**12.80%**	**13.40%**	**9.10%**	**13.20%**	**14.80%**	**14.40%**
Engineering Services						
Aecom	3.40%	4.20%	4.30%	4.90%	4.70%	4.40%
CBI	4.70%	0.60%	6.90%	8.30%	7.80%	8.20%
Fluor	3.60%	4.50%	5.10%	2.60%	3.80%	3.50%
Jacobs Engineering	5.20%	5.70%	5.40%	4.00%	5.00%	5.40%
Mean	**4.50%**	**3.60%**	**5.80%**	**5.00%**	**5.50%**	**5.70%**
Median	**4.70%**	**4.50%**	**5.40%**	**4.00%**	**5.00%**	**5.40%**
Autos and Auto Parts						
Borg Warner	7.80%	0.10%	1.30%	8.90%	11.20%	12.00%
Delphi				6.80%	10.20%	9.60%
Ford	-2.20%	-8.70%	-1.20%	6.80%	6.00%	5.00%
General Motors			-20.10%	3.70%	4.60%	4.70%
Johnson Controls	5.20%	5.20%	1.20%	4.90%	4.90%	5.10%
TRW	4.60%	3.10%	3.60%	8.50%	7.90%	7.80%
Mean				**6.00%**	**5.90%**	**5.70%**
Median				**5.90%**	**5.40%**	**5.10%**

[18] Data provided by Capital Alpha.

Figure 12: Information Technology Profit Margins, 2007–2012

Company	2007	2008	2009	2010	2011	2012
Apple	18.40%	19.30%	21.00%	28.20%	31.20%	35.40%
Cisco	24.90%	23.90%	20.30%	23.00%	19.60%	26.80%
IBM	13.70%	15.40%	17.80%	18.20%	19.00%	21.10%
Intel	21.40%	23.80%	16.30%	35.70%	32.40%	27.70%
Microsoft	36.10%	36.90%	34.80%	38.60%	38.80%	37.80%
Oracle	33.20%	35.00%	35.80%	33.80%	33.80%	46.00%

A potentially even greater profit deterrent to commercial companies doing business with the DoD is the growing realization that the contracting community and audit agencies no longer recognize that a commercial company is allowed to continue to gain profit on its own R&D that modifies its commercial items to meet the DoD's needs. There have been reports that the DoD is attempting to count commercial company R&D as a one-time cost, and therefore a reasonable profit is only allowed on that cost for one year. This will have a chilling effect on future commercial efforts to modify these products to meet DoD needs, as the calculation to make that original investment is based on a long-term return (as shown by the growing—and high—profits, in the commercial IT business, in Figure 12). If this potential policy change is enacted across the DoD enterprise, commercially funded R&D directed at DoD solutions will rapidly evaporate.

Intellectual Property Barriers

Intellectual property rights are the basis for encouraging innovation in a market economy. As one observer noted, "Individuals and institutions also need the proper incentives to be innovative; these incentives may be provided by the marketplace (e.g., to make profits), by the organizations in which individuals work (e.g., to get a promotion and recognition), and by the government regulations and tax structure (e.g., to invest in R&D; Reamer, p.1, 2010). A company's intellectual property (IP) and technical data rights are invaluable resources, central to a contractor's ability to innovate and compete for government and commercial business. If contractors are expected to invest resources and know-how into the next-generation DoD platforms, including incorporating commercially developed technology and products, they should be able to retain exclusive rights to the resulting data. However, many in industry

expressed concerns that some in Congress and the DoD are beginning to take the view that a contractor should be required to commit valuable intellectual capital to programs that, if successful, could result in the transfer of that IP to a contractor's competitors. This could also happen with traditional defense firms, on a one-off basis, but it is not the type of intellectual property/technical data rights regime that will keep many true commercial contractors involved for long.

Industry has long supported laws that allow contractors to retain control of their intellectual property rights. Under existing law, technical data rights determinations on government contracts are primarily based on the source of funding used to "develop" an item or process to which technical data pertain. This enables contractors to make data rights determinations concurrent with technology development, including those occurring under IR&D and bid and proposal (B&P) projects.

Many contractors employ proprietary and commercial manufacturing processes and technology in their performance of DoD contracts. Leveraging proprietary and commercial best practices and technology, developed exclusively at private expense, is more efficient, reduces overall costs, and enables the DoD to benefit from commercial investments made from company profit, and other private investments made by the private sector. Without placing limitations on the scope of data which could be ordered on a deferred basis, and released or disclosed outside the government to contractors, commercial vendors, and other non-standard suppliers, risk the possibility that the DoD can order—at any time—the delivery of technical data that has merely been "utilized" in performance of a DoD contract. This could include limited rights data and other commercial proprietary data, such as detailed manufacturing and process data. In some cases, the associated risks with providing or risking exposure of such data to the government will outweigh the benefits for commercial vendors to pursue DoD business. In other cases, contractors with substantial commercial and military portfolios may reconsider the extent to which they leverage cutting-edge commercial processes and technology improvements across their military programs. This would lead to situations with unintended consequences in which the DoD is unable to access valuable, breakthrough technologies that are available in the commercial marketplace.

Industry has repeatedly voiced its concerns with legislative attempts to deny contractor's proprietary technical data rights, and to force the release or disclosure of a contractor's technical data pertaining to items or processes developed exclusively at private expense. Over the years, industry has maintained that enacting new (more open) technical data rights laws would create significant uncertainty regarding data rights determinations, discourage private sector technology investment, and impair continued government access to breakthrough technologies developed in the private sector. These negative consequences could not be reasonably mitigated and would outweigh any benefit to the government. In recent years, there have been several legislative changes addressing DoD technical data rights. The most recent was in section 815 of the National Defense Authorization Act (NDAA) for Fiscal Year 2012. The impending rule implementing this new law has created great uncertainty for the traditional defense sector and, particularly, to the commercial companies that currently provide commercial solutions, either directly to the DoD or through traditional primes. Depending on how this rule is constructed, it could have a significant impact on commercial company participation in DoD contracts.

Another concern expressed by industry is that even without a new rule on technical data rights, the DoD has maintained an aggressive policy on the delivery of technical data as a condition of doing business with the Department by, for example, making delivery of technical data a source selection criteria. This policy of assigning heavy weighting to ceding of unlimited rights in data in source selection decisions certainly violates the spirit, if not the prohibition, in 10 U.S.C. 2320(a)(2)(F) against requiring a contractor or subcontractor (or a prospective contractor or subcontractor), as a condition of being responsive to a solicitation or as a condition for the award of a contract, to sell or otherwise relinquish to the United States any rights in technical data beyond specified limited rights.

While the DoD wants to accelerate innovation and encourage the entry of new competitors, RFPs often insist that the contractor provide technical data and software developed at private expense, thus undermining the incentive for contractor innovation and erecting another barrier for commercial companies contemplating entry into the government market. Finally, concerns were raised about how the DoD will handle a massive influx of proprietary information: How will it

be stored; will the data be secure; will it be handled properly; and will it not be inadvertently released?

Security Requirements

At the time of the Section 800 Panel report (DoD Acquisition Law Advisory Board, 1993), the Post–Cold-War globalization of the commercial supply chain had not yet taken place. Export controls were not considered a significant barrier in the Panel report to commercial contractors doing business with the federal government, and while FOCI measures in the Exon-Florio Act were mentioned, this was also not a significant finding. Events since this time have raised the importance of these issues in commercial company calculations.

The expiration of the Export Administration Act (EAA) in 1994 began a debate that has yet to conclude on the proliferation of U.S. dual-use commercial technology. The difficulties of reaching a consensus on this issue has led to a 20-year-long exercise of the EAA not being reauthorized and dual-use exports being controlled (under the president's authority under the International Emergency Economic Powers Act). The unauthorized transfer of space launch knowledge to the Chinese in the 1990s resulted in 1999 legislation transferring control of commercial space technology to the Munitions List. A Clinton administration effort to reform export controls in the late 1990s did not achieve appreciable results in this environment.

The events of 9/11 began a further tightening of U.S. export controls implementation and execution. The last two years of the Bush administration saw some export control reform, focused on establishing defense cooperation treaties between the United States and the UK, and one with Australia. The Obama administration has been more successful in achieving export control reform—first, by obtaining congressional approval for commercial satellite technologies to switch back from being ITAR-controlled, and, secondly, by beginning the process of scrubbing the munitions list to provide higher walls around fewer items.

Still, the underlying negative incentives that have developed around several decades of increasingly tightened export policies have left its mark on the decision-making process of commercial firms. There is great apprehension in the leadership of commercial companies that

having a product "tainted" by ITAR would keep it from being exported. There are several strategies to avoid this ITAR taint. The first is to never do business with the U.S. government. The second is to refrain from selling a product to the U.S. government until that product has wide distribution in the commercial marketplace. A third strategy is to shift these kinds of technologies and product developments overseas and allow overseas R&D funds to mature both the technology and the product. As firms become more and more globalized, with operations around the world, it is easier for firms to make these kinds of investment decisions prior to the development of a technology or a product. Barring a significant change in export control laws and their implementation, these factors will continue to impact many commercial firms' investments and government contracting decisions.

The Committee on Foreign Investment in the United States (CFIUS) process that reviews the national security implications of potential foreign ownership of U.S. companies has its own interesting ramifications for commercial companies. At some point, it may be in the interest of companies to be bought by another company. Whether this leads to greater shareholder value, market share, or efficiencies is unimportant for this analysis. What is important is the incentive that is created: The more companies that are interested in buying a firm, the better price they are likely to get in the market. Thus, there is an interest in having foreign firms be potential suitors in any mergers and acquisition transactions.

However, having a subset of the company working on defense applications will give rise to a potentially difficult CFIUS review, and, depending on the nationality of the company that is contemplating the purchase of this U.S. company, any purchase may require divestiture or some type of special security arrangement, or proxy board, to be established in order to move forward with the purchase. This presents an interesting incentive structure for any U.S. firm. Does it make sound business sense for a domestic company to not undertake U.S. defense business in order to become a more attractive target for foreign firms, or does the company decide to comingle its defense and commercial capabilities as a "poison pill" to make it more difficult to be bought by a foreign company?

The need to obtain security clearances was another barrier to participation identified by a few companies, particularly smaller firms. One small firm expressed frustration at the "Catch-22" of

needing cleared employees to be eligible to bid on certain contracts but not being allowed to pre-clear any of them to be able to bid because clearances were only granted after winning the contract. The clearance process would also take a significant amount of time, which would make it difficult to immediately execute any contract win.

Concerns about the risks from the globalization of the supply chain and information security have also created an atmosphere in the DoD that is less inclusive of commercial solutions. Concerns about information security (trap doors and other potential security risks inserted by unscrupulous overseas vendors) or counterfeit parts have called into question the security of the commercial supply chain.

Both issues are causes for legitimate concern. However, there is a deep concern by industry and outside observers that the DoD will overreact to these potential threats and adopt one-size-fits-all strategies when a more narrowly targeted approach is adequate. Concerns were expressed that the DoD may provide incentives to recreate a military-unique supply chain that commercial firms cannot afford. This was a particular concern in the electronics field, where the cost of trusted foundries for electronic components are prohibitively expensive for more than just the most sensitive applications.

Despite a number of private sector concerns about computer information security and counterfeit parts, the commercial IT marketplace is not as robust as it should be for some applications. The key for the DoD is to delineate and discriminate those applications that require different military-unique levels of security assurance and to rely on the commercial marketplace for those areas that aren't as problematic.

Still, there are lessons to be learned from the development of the commercial IT industry of the 1950s and early 1960s that could be applicable to both the counterfeit parts and information security problems. The DoD's need for a higher standard of requirements in this area could serve as an incubator for new technologies and solutions that could solve the DoD's issues. The key factor in attracting commercial firms to solve the DoD's requirements would be a planned path for commercialization of any technology developed to meet DoD requirements. This would help create a highly competitive commercial sector that's able to take those products and apply them

to those commercial sectors (like banking and finance) that need higher levels of information security and supply chain assurance.

For example, in the case of eradicating counterfeits in the supply chain, for most applications the Department could adopt current commercial standards. For a select number of applications, the DoD may require more stringent supply chain procedures and technologies—just as it does with safety-critical aviation parts and nuclear applications. As the Department looks to expand beyond these areas and lower overall compliance costs, it can incentivize the private sector to provide those solutions with a planned path to commerciality, so those firms can sell the same technology, or a commercial derivative technology, to those commercial sectors that may require more stringent counterfeit-parts solutions in the future.

Unique Non-Commercial Acquisition Requirements and Oversight Structure

The process for acquiring goods and services from the commercial marketplace, as established by FASA, has been sub-optimized by many legislative and regulatory changes made in recent years. Most FAR Part 15 contracts include hundreds of clauses that impose costly government-unique requirements, thus increasing the overall cost of acquisition. The government had made progress in this area by simplifying and streamlining its terms and conditions for commercial products and services through the adoption of FAR Part 12 contracting principles. However, the trend seems to be gravitating back to the increased use of FAR Part 15 contracts, which are inconsistent with commercial practices. The result is that the government's costs will increase while company investments in expensive technology improvements will decrease.

Commercial companies are troubled by steady erosion in the government's use of a streamlined approach to commercial item acquisition. Regulatory creep in the form of additional government-unique requirements will negatively impact the DoD's ability to obtain the latest commercial technologies at the lowest possible prices. Examples of regulatory creep include the following:

- required certified cost or pricing data for "noncommercial" modifications to commercial items;

- increased documentation requirements for commercial item determinations that may discourage buying commands from using commercial items;
- increased use of government-unique specifications when alternate commercial products will meet government needs;
- increased pressure to report Small Business Plan results at the contract, rather than enterprise level, which entails more administrative efforts and increases costs;
- increased number of contract clauses that are not customarily used in the commercial marketplace; and
- requiring information other than cost or pricing data for commercial items.

Cost or Pricing Data: One of the major impediments to the acquisition of commercial items is the DoD's continued reliance on cost data as the key determinant of price reasonableness, rather than adapting to commercial pricing conditions. Commercial items produced by commercial firms are exempted from the requirements of the Cost Accounting Standards (CAS) and the Truth in Negotiations Act (TINA) because these firms do not have the capacity or financial incentive to establish unique government accounting compliance systems. Compliance and accounting systems that are in place to meet commercial needs were determined by FASA to be adequate.

Unfortunately, there appears to be a deep-rooted desire within the government oversight community to rely solely on elements of cost, and a growing belief that anyone selling to the government is *ipso facto* a "traditional defense contractor," even if it is a commercial firm that sells a disproportionately small share of its products to the government. The DoD is increasingly taking the position that primarily commercial firms should provide cost or pricing data to the government, and thus appears to be willing to set aside commercially available technology improvements and contracting improvements such as lower government-funded development costs, reduced cycle times, and advanced technical performance.

This desire for more cost or pricing data seems to originate from the 2006 DoD Inspector

General report on commercial items, as was discussed earlier.[19] The concern over the cost of sole-source follow-on buys of primarily commercial item spare parts seems to be leading to demands for cost or pricing information to be applied to a wider aperture of procurements, rather than the narrow set of procurements that should probably be of concern. Even within this narrow set of sole-source commercial item spare parts pricing issues, the DoD needs to first look at its buying practices to determine the source and magnitude of the problem before creating further barriers to the incorporation of commercial items into the Department on a grand scale.

Are these spare parts issues the result of the Department's inability to adequately plan for technology refresh and buy the latest commercial upgrades? Is the increased cost of these spares a result of asking commercial companies on a one-off basis to produce spare parts that it no longer produces for the rest of the commercial marketplace? Is the price increase a result of the commercial company having to make a production run of just a few parts in comparison to a production run where they had both DoD and commercial demand? Why is the DoD in a sole-source situation for its spare parts buys in the first place? Is competition limited because it didn't pay for the right to use the commercial firms' IP, or is it a question of the cost being too high to qualify another supplier? Are the profits that the DoD is concerned about really too high, based on comparable commercial industry benchmarks for industry developed products?

On a related issue, the DoD remains concerned with the part of the commercial item definition that deals with "of a type" customarily used by and sold in substantial quantities to the general public. To change this definition would remove a significant tool for the DoD to access the commercial market. While the DoD declares that it is not intent upon discouraging predominantly commercial companies from participating in the federal contracting process, it has asserted that a number of traditional defense contractors have taken advantage of the "of a type" part of the definition in sole-source procurements. To the contrary, there is a segment of the commercial industry that may be more accurately described as traditional commercial contractors. These companies used the flexibility in FASA to comingle their production lines and took the Department seriously when it wanted civil–military integration of its industrial base to drive down costs. This approach maximized opportunities for items developed for the

[19] The 2005 presentation to the Acquisition Advisory Panel by Henry Kleinknecht in the DoD IG Office on the inadequacy of price analysis for establishing price reasonableness also provides some insight about the oversight community's concern about commercial item procurement.

commercial market to be offered to the DoD as a "dual-use" approach to the market (i.e., true civil–military integration). In fact, there are numerous examples highlighting the success of the DoD's use of commercial items in military programs.

As one commercial contractor noted,

> It is vital that the government oversight community not abandon the original intent of acquisition reform. The Section 800 report, and the ensuing FASA statute, has ultimately expanded the ways the DoD could and should access commercial technology in the marketplace. Unfortunately, in the last two years, the DoD has focused on limiting the definition of a commercial item and expanding access to any and all cost or pricing data. From the outside, this focus appears to have two goals: (1) removing any discretion or exercise of judgment from the contracting official; and (2) attacking profit margins as a way to lower costs.[20]

The first goal abrogates the DoD's responsibility to train its workforce to better understand commercial practices and price evaluation techniques. That may represent the root cause of the DoD's issues with commercial procurement. The second goal is focused on the wrong metric by ignoring (1) the effect of competition on lowering costs; (2) the development costs incurred by industry *vice* DoD; (3) obsolescence costs incurred by industry *vs.* DoD; and (4) the risks absorbed by industry in a commercial procurement.

Audits: Commercial contractors have raised government audits as a concern, since the audits of government-unique contractors begin to bleed into questions of commerciality and require the production of vast amounts of data and support that were not required in the past. This new audit problem has a number of sources: the concerns in Congress about the effectiveness of DCAA and the retirement of seasoned auditors in the government.

In 2008 and 2009, the GAO and Congress (House Armed Services Committee Defense Reform Panel, Commission on Wartime Contracting, Senate Committee on Homeland Security and Governmental Affairs) found that DCAA audit documentation did not support the reported opinions; DCAA supervisors dropped findings and changed audit opinions, without adequate audit evidence for their changes; and DCAA work papers did not show that sufficient work was

[20] From a written response to survey questions.

performed to support the audit opinions. In hearings before the Wartime Commission, DCAA and DCMA were further charged with failure to work together to support audit recommendations.

As a result of the charges, DCAA has taken a more aggressive approach to auditing, including such actions as refusal to meet with companies to discuss audit findings in advance of issuing a report, requests for more evidence at a lower level, and actions to withhold payments until auditor requests for documentation are satisfied and audits are completed.

One factor that hinders the efficient execution of DoD contracts is that audits are taking much longer to complete, a situation exacerbated by the retirement of senior auditors and the influx of new and inexperienced personnel to take their place. Since the end of 2007, there has been a 15% net increase in the DCAA workforce as the agency strives to replace experienced personnel who are approaching retirement (Aerospace Industries Association [AIA], 2011). Seasoned auditors possess a highly technical and unique skill set associated with government contracting. New, less-experienced workers are replacing those with a proven ability to exercise audit judgment based on comprehensive regulatory knowledge. The loss of experienced auditors will result in less efficient oversight and contract administration and greater misunderstandings about the use of commercial contractors in developing and producing DoD systems.

As a result of attrition, contractors are now being required to repeatedly train government personnel on the complex inner workings of their cost-estimating systems. Due to workforce inadequacies, audits, according to industry, are taking an inordinate amount of time to complete, often requiring rework by auditors, and requiring greater focus and efforts by contractors.

Industry is concerned with the amount of time spent during audits and negotiations deliberating whether the contractor is required to obtain cost or pricing data for items provided by subcontractors, particularly commercial contractors. In fact, several traditional contractors reported that auditors were putting pressure on them (to include not certifying their financial systems) to "spec out" commercial contractors and replace them with more traditional subcontractors who could provide cost or pricing data. In another case, DCAA auditors demanded that the contractor "obtain cost or pricing data for a $10 washer to be purchased under

an existing subcontract when the total value of the parts to be supplied by the washer subcontractor for the particular proposal exceeds $700,000" (AIA, p. 15, 2011).

Unique Government Technical Requirements, Specifications, and Standards: The 2009 Defense Science Board Task Force final report to the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]), *Buying Commercial: Gaining the Cost/Schedule Benefits for Defense Systems*, specifically cited the challenges with certification and qualification of commercial technologies to meet military requirements (DSB, 2009). A major cost advantage in the use of many commercial-derivative systems is their adherence to published industry standards. Time and again we were told of the requirements and test and evaluation communities in the services mandating redundant, extremely expensive testing procedures and the use of materials not used in the original commercial product. These changes dramatically drove up the cost of the commercial solution and, in many cases, led to the cancellation of the program that, to a cynic, may have been the rationale for the requirements.

While obviously there are needs for military-unique requirements, some DoD certification processes have been described as setting a "gold standard," while others would argue that these processes lead to "gold-plated" requirements and technologies. DoD leadership should recognize that some flexibility of technical and performance requirements, including certification, is needed to effectively and affordably balance schedule, cost, and performance. Some ideas that were expressed by commercial companies to remove barriers to the incorporation of COTS solutions by the current military qualifications and certification process included the OSD

- standardizing the qualification and certification process and ensuring that the Program Offices and the Technical Authority agree on the process early, and
- reviewing specialized standards that conflict with industry best practices to prevent wholesale design changes and time delays in major systems that incorporate commercial components.

Domestic Source Preferences (Buy American): Another significant barrier to commercial product acquisitions are domestic source restrictions such as the Berry Amendment, Specialty

Metals restrictions, and the Buy American Act (41 U.S.C. §§ 8301 through 8305)—the major domestic preference statute governing procurement by the federal government. Originally enacted in 1933, the Buy American Act is now raised more in the application of exemptions to the act to include the Trade Agreements Act; these include the WTO Agreement on Government Procurement, U.S. Memorandums of Understanding on defense trade with various allied countries, and treaties addressing free trade areas. The result is a convoluted process, where significant gaps don't always correspond to the realities of the commercial supply chain. Information technology producers are still having difficulties supplying compliant products because the Trade Agreements Act exemptions to the Buy American Act are inadequate. Only a few years have passed since many commercial firms came to the brink of no longer supplying their products to the DoD, because of changes in the enforcement of the specialty metals provision that was once a part of the Berry Amendment (10 U.S.C. §§ 2533a and 2533b). Only a new statutory construct and a forward-leaning regulatory implementation averted such a supply chain disaster. Still, the laws in this area are confusing and serve as a barrier to commercial company participation in the DoD market.

A 1996 study conducted by the Logistics Management Institute (LMI) pointed out that these domestic preference mandates are virtually unknown in the commercial world and, as such, are anathema to commercial suppliers. While the LMI study focused on integrated circuits, its findings are still relevant to all commercial firms:

> Several clauses in government contracts serve to restrict the origin of supplies and components either to domestic or to certain specific treaty-determined country sources. These source restrictions have no counterpart in the commercial world and can cut-off DoD from a wide range of suppliers, including overseas plants of U.S. corporations (which are common in the IC industry). FASA does not address either the Buy American Act or the Trade Agreements Act, and so the barriers posed by these laws are still in place. (Gentsch, E. L., Peterson, D. J., & Webster, C. A., p. 1-10, 1996)

Other Unique Government Requirements: There are many other unique processes that came up in our study. These included the bid-protest process; contract disputes resolution; socio-economic programs; billing and contractor payments issues; documentation, audit rights; pass

through requirements; overhead policies; contract types; and differing practices and regulations among the services.

The protest process is one area of federal procurement that baffles many commercial contractors not experienced in conducting business with the government. The ability to sue your customer on a routine—almost expected—basis has no counterpart in the commercial world. Imagine companies routinely suing their customers if they lost a commercial competition. In the commercial marketplace, they probably wouldn't be invited back to work for that company again, but in the government this is general practice—and, increasingly becoming part of a defense firms strategy (if it is not a winner of a competition, particularly if it is the incumbent, since a protest will delay the change). Amazon, which by all definitions is currently a non-traditional commercial contractor, has recently been trying to enter the federal space, but a successful protest overturned one of its first large contract awards. After experiencing the incentive structure that is created by the government's bid protest process, many commercial firms may decide that this is not the market to be in.

Another area that continues to grow over the years is the number of government-imposed socio-economic obligations contained in its contracts, including requirements related to affirmative action, a drug-free work place, subcontracting, and minimum employee wages. While Congress has streamlined contract terms and conditions applicable to commercial items, on occasion, socio-economic strictures surface in government contracts with commercial entities. The most recent new requirement cited by industry is the application of the Federal Funding Accountability and Transparency Act (FFATA) to commercial item contracts. Another well-intentioned socio-economic goal is the proposed FAR case addressing the ending of trafficking in persons—designed to implement E.O. 13627 and Title XVII of the National Defense Authorization Act for Fiscal Year 2013. How these requirements are going to be implemented and applied to commercial item procurements remains to be seen.

VI. Tools to Access Non-Traditional Commercial Contractors

Several tools have been successful in encouraging non-traditional commercial contractors' participation in DoD acquisitions, and, in return, allowing the DoD access to the contractors' technologies and expertise. These tools are market research, commercial item (FAR Part 12) contracting, Other Transactions Authority (OTA), rapid acquisition authorities, and the use of intermediaries—primes, large subsystems contractors, and resellers. Regrettably, all of these methods are currently either under threat or underutilized in the current acquisition environment. However, a potentially promising new tool is the utilization of government venture capital initiatives.

Market Research

It may be difficult for the DoD to accept a commercial solution that meets only 80% of a requirement. However, before embarking on any 10–15 year Major Defense Acquisition Program (MDAP) or Major Automated Information System (MAIS) program, the first step should be to ascertain whether there is anything already in the development pipeline that could even partially meet requirements within the immediate time frame at a lesser cost. The effective use of market research is designed to do just that, as well as to raise the question of the acceptability of the "80% solution" to satisfactorily do the required job.

The use of market research has been a statutory requirement since the 1984 enactment of the Competition in Contracting Act (CICA, 1984). CICA required the use of market research and procurement planning in order to promote the use of competitive procedures in federal contracting. FASA added the requirement that federal agencies conduct market research for any contract exceeding $100,000 (FASA, 1994). The FASA implementing language was contained in the DoD's 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information System Acquisition Programs* (OSD, 2002), and required that market research and analysis be conducted prior to launching any development effort, during the development effort, and prior to the preparation of any product description, to determine the availability and suitability of commercial and non-developmental items (NDIs). 5000.2-R was

rescinded in 2003 and the current 5000 series guidance has only a few references to market research. FAR Part 10, however, prescribes policies and procedures related to market research in order to achieve the most appropriate method of acquiring supplies and services.

One constant refrain heard during this study was that the DoD does a poor job of commercial market research and is not aware of, and does not actively seek, commercial alternatives. There is no centralized function in the DoD, or the services, that advocates alternative commercial solutions or understands what is transpiring in many of the commercial industries that could serve the DoD.

FAR Part 12

FAR Part 12 ("Acquisition of Commercial Items") implements the preference for the acquisition of commercial items, contained in FASA, by establishing acquisition policies most similar to those of the commercial marketplace and encouraging the acquisition of commercial items and components. It stipulates that

> Agencies shall—
> (a) Conduct market research to determine whether commercial items or nondevelopmental items are available that could meet the agency's requirements;
> (b) Acquire commercial items or nondevelopmental items when they are available to meet the needs of the agency; and
> (c) Require prime contractors and subcontractors at all tiers to incorporate, to the maximum extent practicable, commercial items or nondevelopmental items as components of items supplied to the agency. (FAR Part 12)

The FASA statutory changes removed significant barriers to the federal government's acquisition of commercial items. The underlying presumption was that the government would apply terms and conditions consistent with customary commercial practice (FAR Part 12, 52.212-4).

Under FAR Part 12, commercial items are exempt from a range of government statutes and regulations. This exemption has been the most successful tool in bringing in commercial

technologies and practices. However, as noted in the barriers section of this report, concerns within the DoD acquisition policy and oversight communities about the underlying costs and profits made by commercial item contractors are threatening this model.

Another threat to FAR Part 12 is the steady increase in contract clauses applicable to commercial contracting since the enactment of FASA. FASA mandates that only clauses required by law or executive order as applicable to acquisitions of commercial items, or consistent with customary commercial practice, should be applicable to contracts for commercial items. As one commercial contractor observed, "The FAR lists over 50 government-unique clauses that apply to contracts for commercial items, and the DFARS list currently consists of 31 clauses. This lengthy list of clauses is limiting streamlining approaches available under FAR Part 12."[21] Several pending regulatory changes address issues such as technical data rights and counterfeit parts, and could further discourage commercial participation. "When FASA was initially implemented, there were approximately half as many regulatory clauses as are applicable today. With the proliferation of government-unique regulations, predominately commercial companies must choose whether to either expand their infrastructure to comply with these terms, or cease accepting prime contracts."[22]

As one leading observer of government contracting noted, "the difference between using FAR Part 12 and FAR Part 15 is narrowing and at some point it won't really make a difference which authority one uses."[23] While some of these contract clauses have been added by statute, the Office of Federal Procurement Policy (OFPP) has been reluctant to use its authority to waive these statutes, new regulations, and executive branch policies.

Other Transaction Authority (OTA)

Other Transaction Authority (OTA) is a powerful tool that traces its origin to NASA's Space Act of 1958 (Halchin, L. E., 2011). It is defined by a negative, as the authority to enter into transactions other than contracts, grants, or cooperative agreements. This effectively allows an OTA to bypass all of the acquisition rules and regulations in place and allows government and

[21] Company statement in response to study survey questions.
[22] Ibid.
[23] Interview with authors.

industry to sit down with a clean sheet of paper to figure out which requirements should apply to an agreement between a contractor and the government. The DoD gained this authority in 1989 for DARPA research and development projects (subsequently expanded to other parts of the DoD), and in 1993 for prototype projects (10 U.S.C. 2371 and 10 U.S.C. 2371 note). In a December 1999 memorandum on the use of OTAs for prototype projects, the Under Secretary of Defense (AT&L) stated,

> OTA provides tremendous flexibility since instruments for prototype projects, awarded pursuant to this authority, generally are not subject to federal laws and regulations limited in applicability to procurement contracts. It is DoD policy . . . to establish policies and programs that improve, streamline and strengthen DoD Component technology access and development programs, encourage open-market competition and technology-driven prototype efforts that offer increased military capabilities at lower total ownership costs and faster fielding times, and exploit the cost-reduction potential of accessing innovative or commercially developed technologies. (USD[AT&L], 2001)

Subsequently, it was realized that once a commercial firm completed a prototype demonstration, they would have difficulty taking the program into production, because the original legislation limited the OTA to only prototypes. Thus, in 2004, the authorizing legislation was extended to cover production follow-ons to successful prototypes.

Then a 2000 GAO report noted that many OTAs were being given to traditional military-unique contractors. This led Congress in 2001 to amend the OTA prototype authority and limit applicability to the participation of "non-traditional" contractors (generally defined by their not having CAS-covered contracts; NDAA, 2001). Traditional CAS-covered contractors could receive an OTA but would be required to cost share with the government, in exchange for any waiver in procurement rules, or have a non-traditional contractor as a significant participant. Based on this change in statute, Congress looked at the OTA authority as a means to bring new participants into the DoD marketplace, rather than a means to gain new efficiencies from traditional defense contractors. While a colloquy between Senators Bingaman, Nunn, and Warner seems to imply that using OTAs for traditional contractors was one of the original intentions of the legislation in 1993, Congress chose to narrow this application in 2001

(Congressional Record, 1993). The addition of the cost share language has reduced the incentive to use OTAs for more traditional contractors.

The narrower definition (beyond the CAS criterion) of a non-traditional contractor meeting a $500,000 contract threshold has also had an impact on the use of this authority for some commercial companies. As a result, Congress modified the $500,000 threshold in section 866 of the National Defense Authorization Act for Fiscal Year 2011 to have the exception only apply to those contracts above $500,000 that were subject to TINA. However, many non-traditional contractors enter the DoD marketplace under competitive Broad Agency Announcement (BAA) for small research and development contracts or similar competitive contract vehicles. While these BAA's awards are made competitively, there has not been "adequate price competition" for purposes of meeting the exemption from the requirement to provide certified cost or pricing data under subparagraph (a)(1) of FAR 15.403-1. Thus, these firms are no longer eligible for OTAs under the non-traditional definition.

Congress raised further questions about OTAs when one was used to develop the Army's Future Combat System (FCS). This OTA went to a traditional defense contractor but was justified because non-traditional robotics companies were participating in the OTA. The congressional concerns raised about this OTA, and what was likely an over-reaction to these concerns in the Department, led to an additional scaling back of the use of OTA authority. We heard from several non-traditional commercial companies that, from this time forward, OTAs began to lose support within the Department. Since these companies would only conduct R&D with the DoD on an OTA basis, they no longer partnered with the DoD when these vehicles were allowed to lapse.

As noted above, in 2004, Congress authorized a pilot OTA authority for the DoD to conduct limited production of systems beyond a prototype. We could find no evidence that this authority has ever been used. In discussions with non-traditional commercial contractors, they agreed that production OTAs would be a good idea (in fact, a requirement for them to bid on developing the prototype) but believed that the current culture at the DoD and the limitations in the statute have precluded the potential use of such authority. Additionally, it is unclear whether limited production of some units of a subsystem of such an operational prototype would be allowed.

The DoD should clarify whether this is the case and whether OTAs can be authorized for subcontracts. If a determination is made that existing authority is lacking, legislation to expand OTA authority to address these two cases should be considered.

OTA authority offers one of the best ways to access non-traditional contractors and was the vehicle that allowed the DoD to harness new technologies that it would not have been able to access through the traditional acquisition process. The rollback in its use has kept an entire class of commercial contractors and entities from supporting the Department in its attempts to address acquisition challenges.

Rapid Acquisition Authority

Section 811 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (Pub. Law 108-375) contained a provision granting the Secretary of Defense the authority to "waive any provision of law, policy, directive, or regulation that would unnecessarily impede the rapid acquisition and deployment of needed equipment to prevent combat fatalities." This legislation was designed to give the DoD the necessary authority to rapidly respond to urgent needs for capability to address contingency operations in Iraq, Afghanistan, and around the world as it addressed terrorist threats.

As a result of these urgent and compelling needs, the DoD and the services developed a new rapid acquisition system outside of the formal acquisition structure mandated in the DoD 5000 series of acquisition directives and instructions. This informal system pushed the technological envelope in areas necessary to meet changing wartime needs over the last decade. These programs were relatively small and focused on deploying operational capability in a six-month to two-year time frame.

These types of initiatives can serve several purposes. The first is to more quickly deploy technology into the field and meet user requirements in a "compelling need" situation. The second is to prove technology at a smaller unit level that could be potentially scalable and transferred into a major systems program. A third outcome is that the short time frame to

deployment forces the agency to incorporate off-the-shelf (often commercial) technologies quickly into new types of capabilities.

In April 2010, the GAO reported shortcomings in DoD processes for meeting urgent operational needs. According to the GAO (2010),

> DoD's guidance for its urgent needs processes is dispersed and outdated. Further, DoD guidance does not clearly define roles and responsibilities for implementing, monitoring, and evaluating all phases of those processes or incorporate all of the expedited acquisition authorities available to acquire joint urgent need solutions. Data systems for the processes lack comprehensive, reliable data for tracking overall results and do not have standards for collecting and managing data. In addition, the joint process does not include a formal method for feedback to inform joint leadership on the performance of solutions. In the absence of a management framework for its urgent needs processes, DoD lacks tools to fully assess how well its processes work, manage their performance, ensure efficient use of resources, and make decisions regarding the long term sustainment of fielded capabilities (GAO, 2010, p.10)

A 2011 GAO review of the DoD's progress in implementing recommendations and legislative reforms to the rapid acquisition process found that the DoD continued to have significant shortfalls and a "lack of a comprehensive Department-wide strategy [that] has created the risk that its efforts to acquire the latest technology will quickly become duplicative, overlapping and fragmented." The GAO report claimed that the DoD lacked visibility over its own activities and could not provide a definitive number on how much it spends on Department-wide urgent-need efforts—a figure that the GAO estimated to be at least $76.9 billion (GAO, 2011).

While there are obviously some issues that need to be addressed regarding rapid acquisition processes, including sustainment planning and funding, there have been some significant successes in deploying net-centric, unmanned, Counter-IED systems and MRAPs in a timely manner into the field, saving lives in wartime situations. Rapid initiatives proved to be extremely successful in deploying commercial technologies and solutions to meet wartime needs. In fact, many commercial companies who were successful with a rapid acquisition have struggled to find their places in the 15–20-year DoD acquisition process. A significant lesson learned from these efforts was the need for a short time frame, prior to deployment, as a way to

bring in commercial technologies and firms. It would be a mistake if the GAO's concerns were used as a justification for disbanding the rapid acquisition initiatives and forcing the services into the one-size-fits-all straightjacket of the traditional acquisition process.

Use of Intermediaries

If a commercial firm chooses to not deal directly with the government, selling through government-unique primes, large subsystems contractors and resellers have been alternative routes to enable the government to access these technologies and products. Many COTS producers, who do not want to deal with the some of the potential liabilities associated with contracting directly with the government, tend to engage resellers for this market.

In fact, as an unintended consequence of the growing difficulties associated with negotiating a FAR Part 12 contract, more commercial firms may elect to sell only as subcontractors, where the number of flow-down regulations is intended to be minimal. As long as the flow-down restrictions are limited to socio-economic requirements, there should be minimal administrative burden. However, a number of cases were cited illustrating the pressure that oversight agencies and contracting offices have brought to bear on prime contractors to justify their commerciality decisions with regards to their subcontractors. This trend could further erode the number of commercial products in systems as defense-unique contractors attempt to substitute military-unique products for commercial ones.

Still, the use of intermediaries might not be viewed as progress but rather a "workaround" that is also under threat from the questioning of prime contractor's commerciality decisions. As one dual-use company stated, "Typically, it is more economical for the government to buy direct from the Original Equipment Manufacturers (OEMs); however, to avoid these burdensome government-unique clauses, the commercial firm may elect to distribute its products only through prime contractors who are "government defense contractors." This is exactly the scenario that FASA was trying to avoid. The stated goal of civil/military integration was to expand the defense industrial base to include commercial firms. The regulatory proliferation and

related oversight have minimized this tremendous opportunity."[24] There is no doubt that the use of intermediaries raises the cost of commercial items to the government as there is a markup to be paid for management and systems integration provided by these intermediaries, and whose additional value-added is the ability to comply with the government's unique requirements.

Government Venture Capital Initiatives

Indications are that portions of the intelligence community may currently be more open than the DoD is to the use of commercial items and companies. With the Central Intelligence Agency's (CIA's) stand-up of In-Q-Tel (a not-for-profit venture capital firm that invests in high-tech companies for the sole purpose of keeping the CIA and other intelligence agencies equipped with the latest in information technology), some believe that the CIA has a greater understanding of the capabilities of the commercial market for information network and security solutions. While the intelligence community's use of its acquisition authorities was outside the scope of this study, we did hear that there might exist some best practices and additional lessons to be learned from studying this experience.

A useful area of further research is to assess the use of government-sponsored venture capital to help firms develop and bring their solutions into the government. Many firms and observers gave high marks for the In-Q-Tel experience. Interestingly, it may not be the money that In-Q-Tel provides, but the vetting process that provides some certainty about what the government thinks is important to obtain from the commercial market. In one sense, the intelligence community's venture capital process may be an area in which the government is actually doing a good job in its commercial market research. A major industry concern, when dealing with the government, is the uncertainty surrounding whether the government will commit to a product or service once it is developed. In-Q-Tel, according to one financial representative, sparks the interest of the Silicon Valley firms and venture capital community because the intelligence community knows what they want and are willing to pay for it. One Silicon Valley firm we interviewed described the In-Q-Tel money as not being that important from a monetary perspective, but said that In-Q-Tel's vetting process "gave us an ability to interact and learn

[24] Company statement in response to study survey questions.

where the customer wanted to take technology. This is something that the firm as an outsider would have never been able to access."[25] These firms also appear to be allowed to commercialize their experience; however, any assessment of In-Q-Tel's policy on a "path to commercialization" was outside the scope of this study.

While the Army and OSD have experimented with various venture capital initiatives they did not seem to have the same scope for follow-up contracts that the CIA's version does, and this would be an interesting topic to explore in a future study.

[25] Interview with authors.

VII. Conclusions and Recommendations

Non-traditional commercial contractors have played a significant role in supporting U.S. national security from the engagement of commercial manufacturers during World War II, to the joint development of the microelectronics industry in the late 1950–1960s. The introduction of commercial advances from the information technology industry enabled the 1990's "net-centric revolution in military affairs" that incorporated these technologies into DoD systems. Military advances appear to be on the cusp of an unmanned vehicle and robotics revolution that is based on many of these same commercial technologies.

As described in this report, despite initial successes, commercial acquisition has not become ingrained in the DoD acquisition culture and faces severe pushback on many fronts. Based on the study results, the following conclusions can be made about the DoD's ability to access commercial technologies and contractors:

- Commercial markets and technologies will become ever more important to the DoD as its global share of R&D continues to decline. Advances in commercial information technology, telecommunications, logistics, software, robotics, materials, manufacturing, sensor, energy, aerospace, maritime, and other technologies and business practices will continue to develop solutions that have military applications. These technologies and business practices will be widely available, and military advantage will flow to those nations who can "run faster" and incorporate these technologies and practices rapidly into new systems and operations.
- There is an overwhelming consensus that the commercial item acquisition reforms of the 1990s never went as far as they should have to truly integrate the commercial marketplace into the DoD's acquisition planning and implementation. There have been successes (such as the incorporation of commercial information technology and the development of unmanned systems), but these successes often required the involvement of senior leadership to overcome a bureaucracy resistant to change.
- Despite these successes, the acquisition environment at the DoD for non-traditional commercial contractors has eroded significantly in the last five to seven years. DoD

leadership's support for commercial item acquisition has declined and, as a result, financial, intellectual property, and market risks have grown for commercial companies doing business with the DoD, while procurement, security, and oversight barriers have all risen. Successful tools to access commercial contractors (FAR Part 12 and OTA) have been seriously undermined by statute, regulation, or practice.

- While a few commercial firms have left (or never entered) the defense market, many commercial firms are considering adjusting their structure in order to deal with the U.S. government. A large segment of commercial firms are already organized to either sell only through government-unique intermediaries or have created government-unique subsidiaries that are more reflective of traditional defense contractors in cost structure and innovation. As a result, the industrial base structure is at risk of being returned to a primarily pre-1990s military-unique base (with fewer suppliers, due to Post–Cold War consolidation in the 1990s) supplemented by COTS providers who sell through resellers and provide no additional modifications to their products.
- The DoD is currently obtaining adequate (although possibly not the best) commercial technology that it asks for, primarily through intermediaries and at a higher cost. Because of growing barriers, it risks falling behind in the future because the Department
  1) does not fully understand and/or distrusts the capabilities of the commercial marketplace;
  2) continues to construct new barriers to entry in the requirements, contracting, technology security, and test and evaluation processes that are not friendly to commercial solutions;
  3) does not understand how the commercial market works and how it is incentivized;
  4) does not use it well (with a particular risk in areas such as cyber security where commercial solutions will require more development than just COTS); and
  5) has created incentives for firms to not offer their technology to the DoD, not share their intellectual property with the government (for fear of having it released), or not invest in cutting-edge R&D in the United States but rather move this investment overseas. Due to security concerns and current practices, this technology will remain out of the DoD's reach.

Recommendations: If the DoD is to continue to access the benefits of the commercial marketplace, the following recommendations should be considered:

Senior leadership in the Department of Defense needs to aggressively advocate for the acquisition of commercial technology and for the adoption and integration of commercial business practices. This effort will require a long-term commitment, extending over several administrations. A successful advocacy plan would include the following actions:

1) Combat instances of requirements "gold-plating"—a process that continues to support the establishment and maintenance of military-unique requirements, standards, and practices. The requirements, standards, test and evaluation, and technology certification processes need to be reformed to alleviate tendencies to rely solely on military-unique solutions. Stronger legislation than the current preference for commercial items in 41 U.S.C. 3307 may be required to ensure that commercial solutions are the primary baseline to be first considered, and to conduct a cost–benefit analysis before considering any military-unique solution or technology above and beyond current commercial performance thresholds.

2) Re-establish incentives to effectively and robustly use existing authorities to access commercial firms for more than just COTS solutions. These solutions would correspond to Levels 2–8 in the DSB hierarchy outlined earlier.

3) Ensure that DoD rapid acquisition organizations and capabilities are maintained and fully utilized as a means to field solutions (especially commercial ones) faster.

4) Identify and implement "best commercial acquisition practices" (by commercial sector and DoD application) throughout the DoD enterprise. Focus audit agency oversight efforts on benchmarking these governmental and private sector best commercial acquisition practices. Audit agencies need to question evaluation criteria that discriminate against commercial items; otherwise, the efforts of the oversight community risk becoming the mechanism to increase DoD acquisition costs and reduce innovation. The GAO conducted similar best practices work in the 1990s and early 2000 time frame, but little has been done since that time.

5) Encourage the establishment of "non-traditional commercial entities" in private sector firms that are exempt from unique government and DoD rules and oversight. These entities could be entire firms or subsidiaries within a parent firm that would only sell to the DoD products and services that are commercial items, as defined in FAR Part 12 or through an OTA.

6) Expand the use of Other Transaction Authority (OTA) agreements within existing authority and seek legislation, if necessary, to better use OTA authority for production and to access non-traditional commercial subcontractors under a FAR Part 15 contract with a traditional defense prime contractor.

7) Improve market research in the Department and services to better understand what commercial capabilities are available in the market. To consolidate expertise, separate organizations may need to be established to conduct market research, advocate, guide, and (if needed) purchase commercial items for the services and Defense agencies.

8) Plan for a path to commerciality for non-traditional contractors when leveraging the commercial market for DoD-unique requirements. Where the DoD needs a higher standard or requirement than currently being demanded in the commercial marketplace (for example in cyber security, or for a secure supply chain), incentivize firms with a promised path to commercialization that would allow intellectual property to be protected and used in the commercial market.

9) Establish a new Section 800 Panel to recommend specific legislative, regulatory, and policy changes that inhibit the acquisition of commercial items. This new effort should especially review the implications of the globalization of R&D and the commercial supply chain to the DoD's ability to acquire this technology.

10) Periodically benchmark the costs of compliance with government and military-unique requirements, laws, regulations, practices, certifications, and standards. While past studies (Coopers and Lybrand, 1994; Crook, Ketchen, Combs, & Patterson, 2012) have attempted to measure the costs of regulatory compliance from the contracting process,

there are many unique drivers of cost in the defense acquisition system, such as the standards and certification processes, that need to be identified and continually held up to cost–benefit analysis.

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Appendix 1: Statutes Related to Commercial Items[26]

COMMERCIAL ITEM PREFERENCE

41 USC 3307: Preference for commercial items

Text contains those laws in effect on October 11, 2013

From Title 41-PUBLIC CONTRACTS

Subtitle I-Federal Procurement Policy

Division C-Procurement

CHAPTER 33-PLANNING AND SOLICITATION

§3307. Preference for commercial items

(a) Relationship of Provisions of Law to Procurement of Commercial Items.-

(1) This division.-Unless otherwise specifically provided, all other provisions in this division also apply to the procurement of commercial items.

(2) Laws listed in federal acquisition regulation.-A contract for the procurement of a commercial item entered into by the head of an executive agency is not subject to a law properly listed in the Federal Acquisition Regulation pursuant to section 1906 of this title.

(b) Preference.-The head of each executive agency shall ensure that, to the maximum extent practicable-

(1) requirements of the executive agency with respect to a procurement of supplies or services are stated in terms of-

(A) functions to be performed;

(B) performance required; or

(C) essential physical characteristics;

(2) those requirements are defined so that commercial items or, to the extent that commercial items suitable to meet the executive agency's needs are not available, nondevelopmental items other than commercial items may be procured to fulfill those requirements; and

(3) offerors of commercial items and nondevelopmental items other than commercial items are provided an opportunity to compete in any procurement to fill those requirements.

(c) Implementation.-The head of each executive agency shall ensure that procurement officials in that executive agency, to the maximum extent practicable-

(1) acquire commercial items or nondevelopmental items other than commercial items to meet the needs of the executive agency;

(2) require that prime contractors and subcontractors at all levels under contracts of the executive agency incorporate commercial items or nondevelopmental items

[26] Office of the Law Revision Counsel of the United States House of Representatives, United States Code, http://uscode.house.gov

other than commercial items as components of items supplied to the executive agency;

(3) modify requirements in appropriate cases to ensure that the requirements can be met by commercial items or, to the extent that commercial items suitable to meet the executive agency's needs are not available, nondevelopmental items other than commercial items;

(4) state specifications in terms that enable and encourage bidders and offerors to supply commercial items or, to the extent that commercial items suitable to meet the executive agency's needs are not available, nondevelopmental items other than commercial items in response to the executive agency solicitations;

(5) revise the executive agency's procurement policies, practices, and procedures not required by law to reduce any impediments in those policies, practices, and procedures to the acquisition of commercial items; and

(6) require training of appropriate personnel in the acquisition of commercial items.

(d) Market Research.-

(1) When to be used.-The head of an executive agency shall conduct market research appropriate to the circumstances-

(A) before developing new specifications for a procurement by that executive agency; and

(B) before soliciting bids or proposals for a contract in excess of the simplified acquisition threshold.

(2) Use of results.-The head of an executive agency shall use the results of market research to determine whether commercial items or, to the extent that commercial items suitable to meet the executive agency's needs are not available, nondevelopmental items other than commercial items are available that-

(A) meet the executive agency's requirements;

(B) could be modified to meet the executive agency's requirements; or

(C) could meet the executive agency's requirements if those requirements were modified to a reasonable extent.

(3) Only minimum information required to be submitted.-In conducting market research, the head of an executive agency should not require potential sources to submit more than the minimum information that is necessary to make the determinations required in paragraph (2).

(e) Regulations.-

(1) In general.-The Federal Acquisition Regulation shall provide regulations to implement this section, sections 102, 103, 105, and 110 of this title, and chapter 140 of title 10.

(2) Contract clauses.-

(A) Definition.-In this paragraph, the term “subcontract” includes a transfer of commercial items between divisions, subsidiaries, or affiliates of a contractor or subcontractor.

(B) List of clauses to be included.-The regulations prescribed under paragraph

(1) shall contain a list of contract clauses to be included in contracts for the acquisition of commercial end items. To the maximum extent practicable, the list shall include only those contract clauses that are-

(i) required to implement provisions of law or executive orders applicable to acquisitions of commercial items or commercial components; or

(ii) determined to be consistent with standard commercial practice.

(C) Requirements of prime contractor.-The regulations shall provide that the Federal Government shall not require a prime contractor to apply to any of its divisions, subsidiaries, affiliates, subcontractors, or suppliers that are furnishing commercial items any contract clause except those that are-

(i) required to implement provisions of law or executive orders applicable to subcontractors furnishing commercial items or commercial components; or

(ii) determined to be consistent with standard commercial practice.

(D) Clauses that may be used in a contract.-To the maximum extent practicable, only the contract clauses listed pursuant to subparagraph (B) may be used in a contract, and only the contract clauses referred to in subparagraph (C) may be required to be used in a subcontract, for the acquisition of commercial items or commercial components by or for an executive agency.

(E) Waiver of contract clauses.-The Federal Acquisition Regulation shall provide standards and procedures for waiving the use of contract clauses required pursuant to subparagraph (B), other than those required by law, including standards for determining the cases in which a waiver is appropriate.

(3) Market acceptance.-

(A) Requirement of offerors.-The Federal Acquisition Regulation shall provide that under appropriate conditions the head of an executive agency may require offerors to demonstrate that the items offered-

(i) have achieved commercial market acceptance or been satisfactorily supplied to an executive agency under current or recent contracts for the same or similar requirements; and

(ii) otherwise meet the item description, specifications, or other criteria prescribed in the public notice and solicitation relating to the contract.

(B) Regulation to provide guidance on criteria.-The Federal Acquisition Regulation shall provide guidance to ensure that the criteria for determining commercial market acceptance include the consideration of-

(i) the minimum needs of the executive agency concerned; and

(ii) the entire relevant commercial market, including small businesses.

(4) Provisions relating to types of contracts.-

(A) Types of contracts that may be used.-The Federal Acquisition Regulation shall include, for acquisitions of commercial items-

(i) a requirement that firm, fixed price contracts or fixed price with economic price adjustment contracts be used to the maximum extent practicable;

(ii) a prohibition on use of cost type contracts; and

(iii) subject to subparagraph (B), authority for use of a time-and-materials or labor-hour contract for the procurement of commercial services that are commonly sold to the general public through those contracts and are purchased by the procuring agency on a competitive basis.

(B) When time-and-materials or labor-hour contract may be used.-A time-and-materials or labor-hour contract may be used pursuant to the authority referred to in subparagraph (A)(iii)-

(i) only for a procurement of commercial services in a category of commercial services described in subparagraph (C); and

(ii) only if the contracting officer for the procurement-

(I) executes a determination and findings that no other contract type is suitable;

(II) includes in the contract a ceiling price that the contractor exceeds at its own risk; and

(III) authorizes a subsequent change in the ceiling price only on a determination, documented in the contract file, that it is in the best interest of the procuring agency to change the ceiling price.

(C) Categories of commercial services.-The categories of commercial services referred to in subparagraph (B) are as follows:

(i) Commercial services procured for support of a commercial item, as described in section 103(5) of this title.

(ii) Any other category of commercial services that the Administrator for Federal Procurement Policy designates in the Federal Acquisition Regulation for the purposes of this subparagraph on the basis that-

(I) the commercial services in the category are of a type of commercial services that are commonly sold to the general public through use of time-and-materials or labor-hour contracts; and

(II) it would be in the best interests of the Federal Government to authorize use of time-and-materials or labor-hour contracts for purchases of the commercial services in the category.

(5) Contract quality requirements.-Regulations prescribed under paragraph (1) shall include provisions that-

(A) allow, to the maximum extent practicable, a contractor under a commercial items acquisition to use the existing quality assurance system of the contractor as a substitute for compliance with an otherwise applicable requirement for the Federal Government to inspect or test the commercial items before the contractor's tender of those items for acceptance by the Federal Government;

(B) require that, to the maximum extent practicable, the executive agency take advantage of warranties (including extended warranties) offered by offerors of commercial items and use those warranties for the repair and replacement of commercial items; and

(C) set forth guidance regarding the use of past performance of commercial

items and sources as a factor in contract award decisions.
(Pub. L. 111–350, §3, Jan. 4, 2011, 124 Stat. 3754.)

COMMERCIAL ITEM DEFINITION

41 USC 103: Commercial item
Text contains those laws in effect on October 11, 2013
From Title 41-PUBLIC CONTRACTS
Subtitle I-Federal Procurement Policy
Division A-General
CHAPTER 1-DEFINITIONS

SUBCHAPTER I-SUBTITLE DEFINITIONS

§103. Commercial item

In this subtitle, the term "commercial item" means-

(1) an item, other than real property, that-

(A) is of a type customarily used by the general public or by nongovernmental entities for purposes other than governmental purposes; and

(B) has been sold, leased, or licensed, or offered for sale, lease, or license, to the general public;

(2) an item that-

(A) evolved from an item described in paragraph (1) through advances in technology or performance; and

(B) is not yet available in the commercial marketplace but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Federal Government solicitation;

(3) an item that would satisfy the criteria in paragraph (1) or (2) were it not for-

(A) modifications of a type customarily available in the commercial marketplace; or

(B) minor modifications made to meet Federal Government requirements;

(4) any combination of items meeting the requirements of paragraph (1), (2), (3), or (5) that are of a type customarily combined and sold in combination to the general public;

(5) installation services, maintenance services, repair services, training services, and other services if-

(A) those services are procured for support of an item referred to in paragraph (1), (2), (3), or (4), regardless of whether the services are provided by the same source or at the same time as the item; and

(B) the source of the services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government;

(6) services offered and sold competitively, in substantial quantities, in the commercial marketplace based on established catalog or market prices for specific tasks performed or specific outcomes to be achieved and under standard commercial terms and conditions;

(7) any item, combination of items, or service referred to in paragraphs (1) to (6) even though the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a contractor; or

(8) a nondevelopmental item if the procuring agency determines, in accordance with conditions in the Federal Acquisition Regulation, that the item was developed exclusively at private expense and has been sold in substantial quantities, on a competitive basis, to multiple State and local governments.

(Pub. L. 111–350, §3, Jan. 4, 2011, 124 Stat. 3679.)

COTS ITEM DEFINITION

41 USC 104: Commercially available off-the-shelf item
Text contains those laws in effect on October 11, 2013
From Title 41-PUBLIC CONTRACTS
Subtitle I-Federal Procurement Policy
Division A-General
CHAPTER 1-DEFINITIONS

SUBCHAPTER I-SUBTITLE DEFINITIONS

§104. Commercially available off-the-shelf item

In this subtitle, the term “commercially available off-the-shelf item”-

(1) means an item that-

(A) is a commercial item (as described in section 103(1) of this title);

(B) is sold in substantial quantities in the commercial marketplace; and

(C) is offered to the Federal Government, without modification, in the same form in which it is sold in the commercial marketplace; but

(2) does not include bulk cargo, as defined in section 40102(4) of title 46, such as agricultural products and petroleum products.

(Pub. L. 111–350, §3, Jan. 4, 2011, 124 Stat. 3679.)

Appendix 2: The “Perry Memo”

29 June 9

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
Chairman of the Joint Chiefs of Staff Under Secretaries of Defense Comptroller Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)
General Counsel Inspector General Director of Operational Test and Evaluation Directors of the Defense Agencies Commander-in-Chief, U.S. Special Operations Command

SUBJECT: Specifications & Standards - A New Way of Doing Business

To meet future needs, the Department of Defense must increase access to commercial state-of-the-art technology and must facilitate the adoption by its suppliers of business processes characteristic of world class suppliers. In addition, integration of commercial and military development and manufacturing facilitates the development of dual-use processes and products and contributes to an expanded industrial base that is capable of meeting defense needs at lower costs.

I have repeatedly stated that moving to greater use of performance and commercial specifications and standards is one of the most important actions that DoD must take to ensure we are able to meet our military, economic, and policy objectives in the future. Moreover, the Vice President's National Performance Review recommends that agencies avoid government-unique requirements and rely more on the commercial marketplace.

To accomplish this objective, the Deputy Under Secretary of Defense (Acquisition Reform) chartered a Process Action Team to develop a strategy and a specific plan of action to decrease reliance, to the maximum extent practicable, on military specifications and standards. The Process Action Team report, "Blueprint for Change," identifies the tasks necessary to achieve this objective. I wholeheartedly accept the Team's report and approve the report's primary recommendation to use performance and commercial specifications and standards in lieu of military specifications and standards, unless no practical alternative exists to meet the user's

needs. I also accept the report of the Industry Review Panel on Specifications and Standards and direct the Under Secretary of Defense (Acquisition and Technology) to appropriately implement the Panel's recommendations.

I direct the addressees to take immediate action to implement the Team's recommendations and assign the Under Secretary of Defense (Acquisition and Technology) overall implementation responsibility. I direct the Under Secretary of Defense (Acquisition and Technology) to immediately arrange for reprogramming the funds needed in FY94 and FY95 to efficiently implement the recommendations. I direct the Secretaries of the Military Departments and the Directors of the Defense Agencies to program funding for FY96 and beyond in accordance with the Defense Planning Guidance. Policy Changes

Listed below are a number of the most critical changes to current policy that are needed to implement the Process Action Team's recommendations. These changes are effective immediately. However, it is not my intent to disrupt on-going solicitations or contract negotiations. Therefore, the Component Acquisition Executive (as defined in Part 15 of DoD Instruction 5000.2), or a designee, may waive the implementation of these changes for on-going solicitations or contracts during the next 180 days following the date of this memorandum. The Under Secretary of Defense (Acquisition and Technology) shall implement these policy changes in DoD Instruction 5000.2, the Defense Federal Acquisition Regulation Supplement (DFARS),and any other instructions, manuals, regulations, or policy documents, as appropriate. Military Specifications and Standards: Performance specifications shall be used when purchasing new systems, major modifications, upgrades to current systems, and non- developmental and commercial items, for programs in any acquisition category. If it is not practicable to use a performance specification, a non-government standard shall be used. Since there will be cases when military specifications are needed to define an exact design solution because there is no acceptable non-governmental standard or because the use of a performance specification or non-government standard is not cost effective, the use of military specifications and standards is authorized as a last resort, with an appropriate waiver.

Waivers for the use of military specifications and standards must be approved by the Milestone

Decision Authority (as defined in Part 2 of DoD Instruction 5000.2). In the case of acquisition category ID programs, waivers may be granted by the Component Acquisition Executive, or a designee. The Director, Naval Nuclear Propulsion shall determine the specifications and standards to be used for naval nuclear propulsion plants in accordance with Pub. L. 98-525 (42 U.S.C. '7158 note).Waivers for reprocurement of items already in the inventory are not required. Waivers may be made on a "class" or items basis for a period of time not to exceed two years. Innovative Contract Management: The Under Secretary of Defense (Acquisition and Technology) shall develop, within 60 days of the date of this memorandum, Defense Federal Acquisition Regulation Supplement (DFARS) language to encourage contractors to propose non-government standards and industry-wide practices that meet the intent of the military specifications and standards. The Under Secretary will make this language effective 180 days after the date of this memorandum. This language will be developed for inclusion in both requests for proposal and in on-going contracts. These standards and practices shall be considered as alternatives to those military specifications and standards cited in all new contracts expected to have a value of $100,000 or more, and in existing contracts of $500,000 or more having a substantial contract effort remaining to be performed.

Pending completion of the language, I encourage the Secretaries of the Military Departments and the Directors of the Defense Agencies to exercise their existing authority to use solicitation and contract clause language such as the language proposed in the Process Action Team's report. Government contracting officers shall expedite the processing of proposed alternatives to military specifications and standards and are encouraged to use the Value Engineering no-cost settlement method (permitted by FAR 48.104-3) in existing contracts.

Program Use of Specifications and Standards: Use of specifications and standards listed in DoD Instruction 5000.2 is not mandatory for Program Managers. These specifications and standards are tools available to the Program Manager, who shall view them as guidance, as stated in Section 6-Q of DoD Instruction 5000.2.

Tiering of Specification and Standards: During production, those system specifications, subsystem specifications and equipment/product specifications (through and including the first-

tier reference in the equipment/product specifications) cited in the contract shall be mandatory for use. Lower tier references will be for guidance only, and will not be contractually binding unless they are directly cited in the contract. Specifications and standards listed on engineering drawings are to be considered as first-tier references. Approval of exceptions to this policy may only be made by the Head of the Departmental or Agency Standards Improvement Office and the Director, Naval Nuclear Propulsion for specifications and drawings used in nuclear propulsion plants in accordance with Pub. L. 98-525 (42 U.S.C. '7158 Note).

New Directions

Management and Manufacturing Specifications and Standards: Program Managers shall use management and manufacturing specifications and standards for guidance only. The Under Secretary of Defense (Acquisition and Technology)shall develop a plan for canceling these specifications and standards, inactivating them for new designs, transferring the specifications and standards to non-government standards, converting them to performance-based specifications, or justifying their retention as military specifications and standards. The plan shall begin with the ten management and manufacturing standards identified in the Report of the Industry Review Panel on Specifications and Standards and shall require completion of the appropriate action, to the maximum extent practicable, within two years.

Configuration Control: To the extent practicable, the Government should maintain configuration control of the functional and performance requirements only, giving- contractors responsibility for the detailed design.

Obsolete Specifications: The "Department of Defense Index of Specifications and Standards" and the "Acquisition Management System and Data Requirements Control List" contain outdated military specifications and standards and data requirements that should not be used for new development efforts. The Under Secretary of Defense (Acquisition and Technology) shall develop a procedure for identifying and removing these obsolete requirements.

Use of Non-Government Standards: I encourage the Under Secretary of Defense (Acquisition and Technology) to form partnerships with industry associations to develop non-government

standards for replacement of military standards where practicable. The Under Secretary shall adopt and list in the "Department of Defense Index of Specifications and Standards"(DoDISS) non-government standards currently being used by DoD. The Under Secretary shall also establish teams to review the federal supply classes and standardization areas to identify candidates for conversion or replacement.

Reducing Oversight: I direct the Secretaries of the Military Departments and the Directors of the Defense Agencies to reduce direct Government oversight by substituting process controls and non-government standards in place of development and/or production testing and inspection and military-unique quality assurance systems.

Cultural Changes

Challenge Acquisition Requirements: Program Managers and acquisition decision makers at all levels shall challenge requirements because the problem of unique military systems does not begin with the standards. The problem is rooted in the requirements determination phase of the acquisition cycle.

Enhance Pollution Controls: The Secretaries of the Military Departments and the Directors of the Defense Agencies shall establish and execute an aggressive program to identify and reduce or eliminate toxic pollutants procured or generated through the use of specifications and standards. Education and Training: The Under Secretary of Defense (Acquisition and Technology) shall ensure that training and education programs throughout the Department are revised to incorporate specifications and standards reform.

Program Reviews: Milestone Decision Authority (MDA) review of programs at all levels shall include consideration of the extent streamlining, both in the contract and in the oversight process, is being pursued. The MDA (i.e., the Component Acquisition Executive or his/her designee, for all but ACAT 1D programs) will be responsible for ensuring that progress is being made with respect to programs under his/her cognizance.

Standards Improvement Executives: The Under Secretary the Secretaries of the Military

Departments, and the Director of the Defense Logistics Agency shall appoint Standards Improvement Executives within 30 days. The Standards Improvement Executives shall assume the responsibilities of the current Standardization Executives, support those carrying out acquisition reform, direct implementation of the military specifications and standards reform program, and participate on the Defense Standards Improvement Council. The Defense Standards Improvement Council shall be the primary coordinating body for the specification and standards program within the Department of Defense and shall report directly to the Assistant Secretary of Defense (Economic Security). The Council shall coordinate with the Deputy Under Secretary of Defense (Acquisition Reform) regarding specification and standards reform matters, and shall provide periodic progress reports to the Acquisition Reform Senior Steering Group, who will monitor overall implementation progress.

Management Commitment

This Process Action Team tackled one of the most difficult issues we will face in reforming the acquisition process. I would like to commend the team, composed of representatives from all of the Military Departments and appropriate Defense Agencies, and its leader, Mr. Darold Griffin, for a job well done. In addition, I would like to thank the Army, and in particular, Army Materiel Command, for its administrative support of the team.

The Process Action Team's report and the policies contained in this memorandum are not a total solution to the problems inherent in the use of military specifications and standards; however, they are a solid beginning that will increase the use of performance and commercial specifications and standards. Your leadership and good judgment will be critical to successful implementation of this reform. I encourage you and your leadership teams to be active participants in establishing the environment essential for implementing this cultural change. This memorandum is intended only to improve the internal management of the Department of Defense and does not create any right or benefit, substantive or procedural, enforceable at law or equity by a party against the Department of Defense or its officers and employees.

//signed//

William J. Perry

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Throughout his career, Dr. Gansler has written, published, testified, and taught on subjects related to his work. He is the author of five books and over 100 articles. His most recent book is *Democracy's Arsenal: Creating a 21st Century Defense Industry* (MIT Press, 2011).

In 2007, Dr. Gansler served as the chair of the Secretary of the Army's Commission on Contracting and Program Management for Army Expeditionary Forces. He is a member of the Defense Science Board and the Government Accountability Office (GAO) Advisory Board. He is also a member of the National Academy of Engineering and a fellow of the National Academy of Public Administration. Additionally, he is the Glenn L. Martin Institute Fellow of Engineering at the A. James Clarke School of Engineering; an affiliate faculty member at the Robert H. Smith School of Business; and a senior fellow at the James MacGregor Burns Academy of Leadership (all at the University of Maryland). From 2003–2004, he served as Interim Dean of the School of Public Policy at the University of Maryland, and from 2004–2006, Dr. Gansler served as the Vice President for Research at the University of Maryland.

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William Greenwalt is a visiting fellow at the Marilyn Ware Center for Security Studies at the American Enterprise Institute (AEI), where he is working on defense and aerospace acquisition issues and industrial base policy.

Mr. Greenwalt has broad-ranging experience in the field and has served in senior positions at the Pentagon, in Congress, and in the defense industry. As Deputy Under Secretary of Defense for Industrial Policy, he advised the Under Secretary of Defense for Acquisition, Technology, and Logistics on all matters relating to the defense industrial base. In Congress, he served as Deputy Director for the Surveys and Investigations staff of the House Appropriations Committee, as well as a professional staff member for the Senate Armed Services and Senate Governmental Affairs Committees. As a Senate staff member, Greenwalt's work on reforms of management and acquisition practices led to the Clinger–Cohen Act of 1996. Mr. Greenwalt has also worked for Lockheed Martin as Director of Federal Acquisition Policy. Immediately before joining AEI, he was Vice President of Acquisition Policy at the Aerospace Industries Association where he developed and coordinated the aerospace industry position on a variety of related issues.

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William Lucyshyn is the Director of Research and a Senior Research Scholar at the Center for Public Policy and Private Enterprise in the School of Public Policy at the University of Maryland. In this position, he directs research on critical policy issues related to the increasingly complex problems associated with improving public-sector management and operations and with how government works with private enterprise.

His current projects include modernizing government supply-chain management, identifying government sourcing and acquisition best practices, and analyzing Department of Defense business modernization and transformation. Previously, Mr. Lucyshyn served as a Program Manager and the Principal Technical Advisor to the Director of the Defense Advanced Research Projects Agency (DARPA) on the identification, selection, research, development, and prototype production of advanced technology projects.

Prior to joining DARPA, Mr. Lucyshyn completed a 25-year career in the U.S. Air Force. Mr. Lucyshyn received his bachelor's degree in engineering science from the City University of New York and earned his master's degree in nuclear engineering from the Air Force Institute of Technology. He has authored numerous reports, book chapters, and journal articles.

The Center for Public Policy and Private Enterprise provides the strategic linkage between the public and private sector to develop and improve solutions to increasingly complex problems associated with the delivery of public services — a responsibility increasingly shared by both sectors. Operating at the nexus of public and private interests, the Center researches, develops, and promotes best practices; develops policy recommendations; and strives to influence senior decision-makers toward improved government and industry results. The Center for Public Policy and Private Enterprise is a research Center within the University of Maryland's School of Public Policy.